



Handbook

ARSonic
<http://www.arsonic.de>

Version 1.4.0
July 15, 2015

Contents

1 Safety Instructions	5
1.1 Precautions	5
1.2 Installation	5
1.3 Operation	5
2 T-8000 8x8 Audio Matrix and Paging Controller	6
2.1 General Information	6
2.2 Features	6
2.3 Views	7
2.4 System Address	9
2.5 Selection Mode	9
2.6 Source Select	9
2.7 Audio Inputs	10
2.8 Monitoring of Zone Outputs	10
2.9 Priority Paging	10
2.10 Alarm and Emergency Functions	11
2.11 Connection Diagram	12
2.12 Technical Data	13
3 T-8000A Paging Microphone	14
3.1 General Information	14
3.2 Features	14
3.3 Views	15
3.4 Operation	16
3.5 Technical Data	16
4 T-8000AE Extension Control Keypad	17
4.1 General Information	17
4.2 View	17
4.3 Connection	18
4.4 Technical Data	18
5 T-8000B/T-8000BW Remote Control with Audio Input	19
5.1 General Information	19
5.2 Features	19
5.3 Views	20
5.4 Technical Data	20
6 T-60BU/120BU/240BU USB Mixer Amplifier	21
6.1 General Information	21
6.2 Features	21
6.3 Views	22
6.4 Speaker Connections	23
6.5 Priority Paging	24
6.6 Connection Diagram	24
6.7 Technical Data	25
7 TI-60BU/120BU/240BU Five Zone USB Mixer Amplifier	26
7.1 General Information	26
7.2 Features	26
7.3 Views	27
7.4 Speaker Connections	28
7.5 Priority Paging	29
7.6 Zone Select	29
7.7 Connection Diagram	29
7.8 Technical Data	30

8 TI-120S/240S/350S Five Zone Mixer Amplifier	31
8.1 General Information	31
8.2 Features	31
8.3 Views	32
8.4 Speaker Connections	33
8.5 Volume of Zone	34
8.6 Connection of Paging Microphone	34
8.7 Connection Diagram	35
8.8 Technical Data	36
9 T-4060MP/4120MP Four Zone Mixer Amplifier	37
9.1 General Information	37
9.2 Features	37
9.3 Views	38
9.4 Mode of Operation Inputs 1–3	39
9.5 Speaker Connections	40
9.6 Monitor Output	40
9.7 Zone Select	40
9.8 Priority Mute	40
9.9 Ground Lift	41
9.10 Technical Data	41
10 T-2S01 Stereo Mixer Pre-Amplifier	42
10.1 General Information	42
10.2 Features	42
10.3 Views	43
10.4 Mode of Operation Inputs 2–10	44
10.5 Priority Paging	44
10.6 Connection Diagram	44
10.7 Technical Data	45
11 T-6245 Six Zone Mixer with Voice Recorder	46
11.1 General Information	46
11.2 Features	46
11.3 Views	47
11.4 Signal Routing	48
11.5 Zone Select for BGM/Mic	49
11.6 Voice Recording	49
11.7 Microphone Alarm Mode	49
11.8 Repeat of Voice Recording	50
11.9 Priority Mute	50
11.10 Connection Diagrams	51
11.11 Technical Data	53
12 T-2150X/2300X Power Amplifier	54
12.1 General Information	54
12.2 Features	54
12.3 Views	55
12.4 Audio Inputs	56
12.5 Speaker Connections	57
12.6 Ground Lift	57
12.7 Technical Data	58
13 T-6221 CD/MP3-Player	59
13.1 General Information	59
13.2 Features	59
13.3 Views	60
13.4 Operation	61
13.5 Monitor Loudspeaker	61
13.6 Technical Data	61

14 T-2221 CD/MP3-Player with Tuner	62
14.1 General Information	62
14.2 Features	62
14.3 Views	63
14.4 Operation	64
14.5 Technical Data	65
15 T-318 Paging Microphone	66
15.1 General Information	66
15.2 Features	66
15.3 Views	67
15.4 Connection Diagram	69
15.5 Technical Data	69
16 T-319 Paging Microphone	71
16.1 General Information	71
16.2 Features	71
16.3 Views	72
16.4 Connection Diagram	73
16.5 Technical Data	73
17 T-328 Paging Microphone	75
17.1 General Information	75
17.2 Features	75
17.3 Views	76
17.4 Emergency Call	77
17.5 Connection Diagram	77
17.6 Technical Data	78
18 T-4012 Paging Microphone	79
18.1 General Information	79
18.2 Features	79
18.3 Views	80
18.4 Connection Diagram	81
18.5 Technical Data	81
19 T-511C Microphone	82
19.1 Features	82
19.2 On/Off Button	82
19.3 Technical Data	82
20 T-531 Microphone	83
20.1 Features	83
20.2 On/Off Button	83
20.3 Technical Data	83
List of Figures	84

1 Safety Instructions

1.1 Precautions

Be sure to read the instructions in this section carefully before use. Make sure to observe the instructions and the safety symbols.

We recommend you keep this instruction manual handy for future reference.

1.2 Installation

- Do not expose this apparatus to rain or moisture and don't use it in damp areas or near water. The apparatus shall not be exposed to dripping or splashing water and no objects filled with liquids shall be placed on the apparatus.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus that produce heat.
- Operate the device with the specified operating voltage only.
- Do not touch the power plug with wet hands when removing or plugging the plug into the outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- When the AC Power is on, there is a potential of having dangerous voltage at the output terminals on the rear of an amplifier. Use caution not to touch these contacts. Turn off the AC Mains disconnect switch prior to making any connections.

1.3 Operation

- In case of the following conditions, immediately switch off the power, disconnect the power supply plug from the AC outlet and contact your nearest ARSonic dealer. Make no further attempt to operate the unit in this condition as this may cause fire or electric shock.
 - smoke or a strange smell coming from the unit.
 - water or any metallic object got into the unit
 - broken case after a unit's fall
 - damaged power supply cord
 - no function
- Do not block any ventilation opening.
- Make sure that the volume control is set to minimum position before power is switched on.
- Do not operate the unit for an extended period of time with distorted audio.



Caution

To reduce the risk of electrical shock, do not remove the cover. There are no user serviceable parts inside, refer all servicing to qualified personnel.

2 T-8000 8x8 Audio Matrix and Paging Controller

2.1 General Information

The T-8000 offers the option to combine several sources and announcements into 8 zones (may be expanded up to 32 zones). It represents a complete solution for multi-zone projects and multi-functional installations. Typical applications are hotels, sport venues or shopping malls.

2.2 Features

- The T-8000 combines up to eight music sources, eight remote controls, two paging microphones, and a microphone input
- All inputs may be simultaneously assigned to any of the zone outputs
- A remote paging microphone and three different remote control devices further extend the flexibility of the system
- The T-8000 may be expanded up to 32 zones. The connection of four T-8000 units will form a 8x32 matrix
- Nine LC displays (program, local input/monitor and input selection), LEDs (level meter of the monitor output, microphone priority and channel busy)
- Individual tone (bass, treble) and volume control per channel. Remote volume control available
- Three different chimes for alarm and evacuation
- Connection between the different units via CAT-5 cable
- Four keys for direct BGM and paging access
- 110 or 240 V AC and 24 V DC operation selectable
- Five levels of priority (Microphone 1, Fire Alarm, Paging Mic, Remote Control and BGM)

2.3 Views

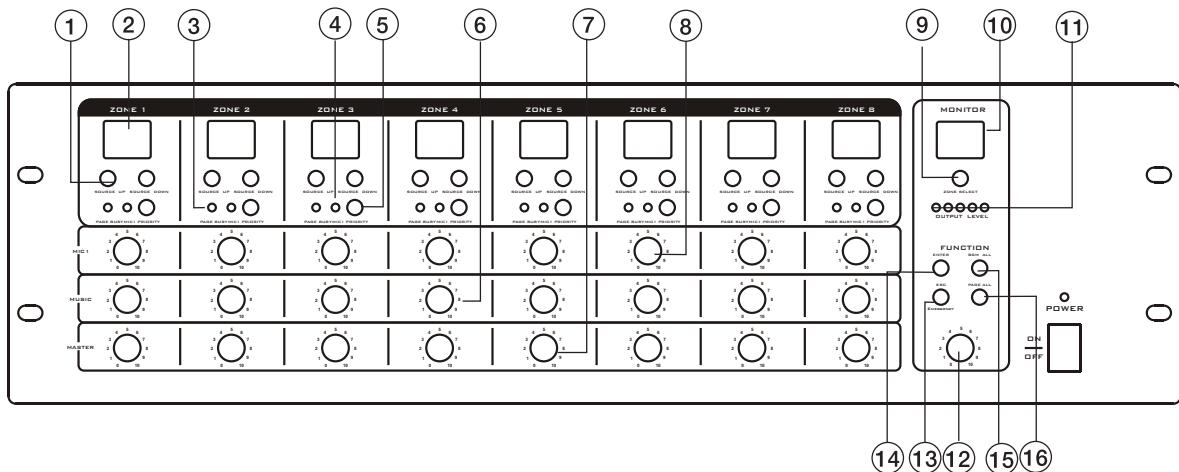


Figure 2.1: T-8000 - Front View

Front Panel

- 1 Source Selector for the Zone (refer to [section 2.6](#))
- 2 Alphanumeric Display of the Source (refer to [section 2.6](#))
- 3 „Zone busy“ Indicator (refer to [section 2.9](#))
- 4 Microphone 1 Priority Indicator (refer to [section 2.9](#))
- 5 Microphone 1 Priority Button (refer to [section 2.9](#))
- 6 Volume Source
- 7 Volume Mix
- 8 Volume Microphone 1
- 9 Zone Select for Monitoring (refer to [section 2.8](#))
- 10 Alphanumeric Display Monitoring (refer to [section 2.8](#))
- 11 Levelmeter (refer to [section 2.8](#))
- 12 Volume Monitoring (refer to [section 2.8](#))
- 13 Cancel (refer to [section 2.5](#))
- 14 Enter (refer to [section 2.5](#))
- 15 BGM to all Zones
- 16 Priority of Microphone 1 to all Zones (refer to [section 2.9](#))

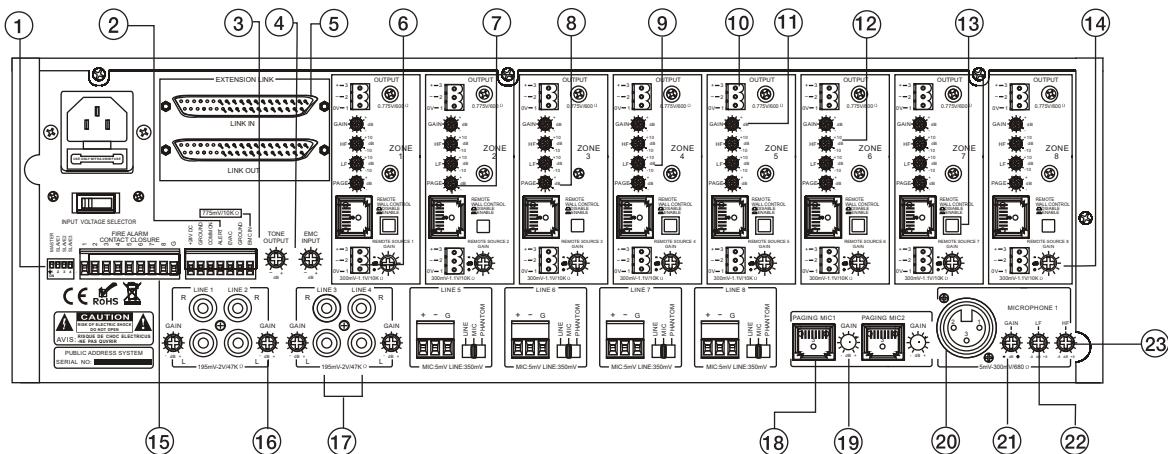


Figure 2.2: T-8000 - Rear View

Rear Panel

- 1 DIP-Switch System Address (refer to [section 2.4](#))
- 2 Connector for Alarm and Emergency Functions (refer to [section 2.10](#))
- 3 Volume Alarm (refer to [section 2.10](#))
- 4 Volume Audio Input EMC (refer to [section 2.10](#))
- 5 Extension Link (refer to [section 2.4](#))
- 6 Remote Audio Input (refer to [section 2.7](#))
- 7 Remote Control (RJ45)
- 8 Volume external Paging Microphones
- 9 Tone Control Bass
- 10 Audio Output Zone
- 11 Gain Audio Output Zone
- 12 Tone Control Treble
- 13 Enable/Disable Remote Control
- 14 Gain Remote Audio Input
- 15 Dry Contacts Fire Alarm per Zone (refer to [section 2.10](#))
- 16 Gain Line 1-4
- 17 Audio Inputs Line 1-8 (refer to [section 2.7](#))
- 18 Paging Microphone Connection
- 19 Gain Paging Microphone
- 20 Audio Input Microphone 1
- 21 Gain Microphone 1
- 22 EQ Bass Microphone 1
- 23 EQ Treble Microphone 1

2.4 System Address

Up to four T-8000 may be connected together to form a bigger system. The extension affects only the number of addressable zones. Only the signal inputs of the main device (Master) are active. All other inputs of the extension (slave) devices incl. the remote inputs are deactivated.

The T-8000 units are interconnected via the *EXTENSION LINK* sockets. In each case two devices are being connected via a 37 pin ribbon cable with male and female Sub-D connectors.

A DIP-Switch on the back of the unit determines the status of the T-8000 device either as master or slave (extension) device. For a master device the switch has to be set to *ON*.



Caution

A T-8000B/BW (refer to [section 5](#)) per zone may be connected to the extension units.

2.5 Selection Mode

After selecting a zone with the *SOURCE*, *ZONE SELECT* oder *BGM ALL* key, the *ENTER* key needs to be pressed and held down for 10 seconds. The display will blink during this time. Other than that the previous setting will be kept.

The process may be stopped any time by the *ESC* key.

2.6 Source Select

The *SOURCE UP* and *SOURCE DOWN* keys select the signal sources of a zone:

- L1-L8: Line 1–4 and Line/Mic 5–8 inputs
- L: Remote input (PHOENIX) from the wall mounted control module (RJ45)
- OF: No source selected



Caution

The Remote input (PHOENIX) can only be output in the selected zone.

The *BGM ALL* key assigns Line 1 to all available zones.

2.7 Audio Inputs

The unbalanced RCA line inputs 1–4 offer a sensitivity potentiometer.

The balanced Mic/Line inputs are accessible through a PHOENIX socket. A selecting switch sets the signal sources:

Position	Source
Line	Line-level
Mic	Dynamic Microphone
Phantom	Phantoms powered microphone

The Remote input of a zone is an additional balance line level input (PHOENIX) that is being played in that specific zone.

The *MICROPHONE 1* input pages all zones (also see [section 2.9](#)).

2.8 Monitoring of Zone Outputs

The T-8000 provides a small monitor loudspeaker. The *ZONE SELECT* key selects the zone to be monitored. The alphanumeric display indicates the selected zone.

A levelmeter will show the level of the selected zone output.



Caution

The loudspeaker of the T-8000 is built into the bottom of the unit. It is recommended to keep a distance of one RU to the device below.

2.9 Priority Paging

Different priorities apply if several microphones are being connected to the T-8000:

- External T-8000A (see [section 3](#)) paging mics have the highest priority. The *PAGE BUSY* LED of the corresponding Zone will illuminate during an announcement.
- The *MICROPHONE 1* input has a mid-level priority. Depending on the key *PRIORITY* the microphone signal will be added to the signal source or cut out. The *PAGE ALL* key will assign priority for all zones to the microphone.
- Microphones connected to the Mic/Line 5–8 inputs have the lowest priority



Caution

A selected priority for microphone 1 will be lost if the T-8000 is being turned off. To regain its priority it needs to be activated again.

2.10 Alarm and Emergency Functions

The two PHOENIX terminals on the backside of the T-8000 are provided for alarm and emergency functions

The pins *+24V DC* and *GROUND* are for the connection to a 24 Volts backup power supply (DC) with a minimal power of 2 Ampere.

The contact inputs 1–8 will start an alarm signal in the assigned zone if the input is connected to pin *G* (common ground). The zone display will blink and show *AL*. The alarm level may be set with the *TONE OUTPUT* trimmer.

The contact inputs *ALERT* and *EVAC* determine the type of alarm signal. To select the desired type, connect the corresponding pin to *COMMON*:

Pin	Alarmsignal
ALERT	pulsating tone
EVAC	rising siren

In addition or alternatively it is possible to feed a special (external) alarm signal to the audio input *EMC IN* and *GND*. The trimmer *EMC INPUT* adjusts the volume of the external signal.

2.11 Connection Diagram

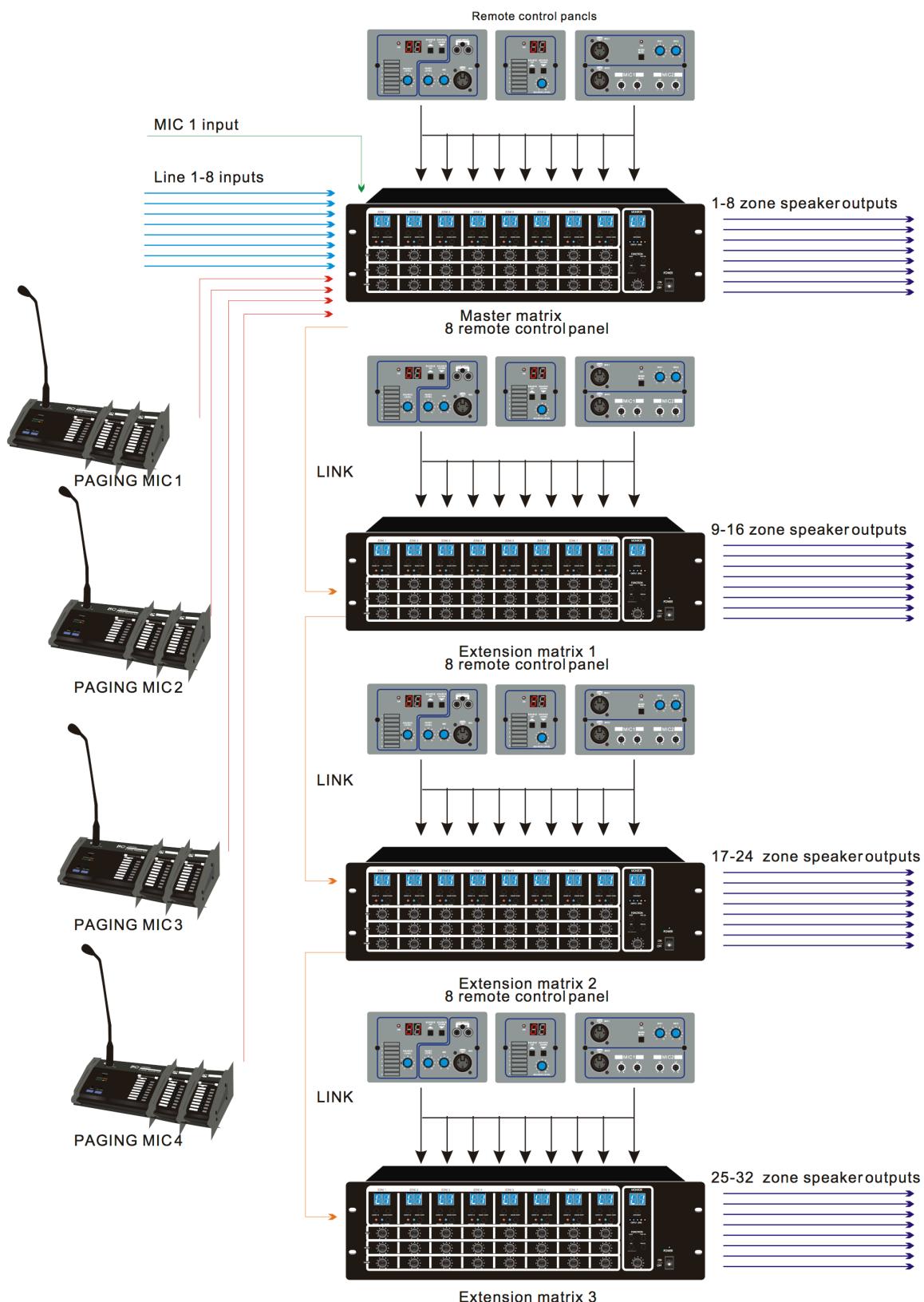


Figure 2.3: T-8000 Series - Connection Diagram

2.12 Technical Data

T-8000	
Microphone Input 1	Sensitivity: 5 mV-280 mV /600 Ohms
Inputs Mic 5-8	Sensitivity: 5 mV /600 Ohms S/N: > 65 dB Frequency Response: 80 Hz - 18 kHz Phantom Power: 48 V switchable (Mic 5-8)
Inputs Line 1-4	195 mV to 2 V /47 kOhms
Inputs Line 5-8	350 mV /47 kOhms S/N: > 85 dB Frequency Response: 20 Hz - 20 kHz
THD	< 0.07 %
Tone Control Bass	+/- 10dB @ 100Hz
Tone Control Treble	+/- 10dB @ 10kHz
Mains	220-240 V AC, 50-60 Hz
Backup Power	24 V DC
Power Consumption	max. 30 W
Dimensions	484 x 325 x 133 mm
Weight	6 kg

3 T-8000A Paging Microphone

3.1 General Information

The T-8000A paging microphone (paging station) is designed to work with the T-8000 8x8 Audio Matrix. It is connected via a standard CAT-5 cable.

The paging station includes the paging control of up to eight zones and may be extended with the T-8000AE keypad extension (see [section 4](#)).

3.2 Features

- Connection of the T-8000A paging station to the T-8000 central unit via CAT-5
- Each T8000 offers two RJ-45 Interfaces
- External 24 V power supply for distances > 50 m
- Eight zone selection keys
- All Calls
- Selectable 2-/4-tone chime
- Adjustable gain for microphone and chime

3.3 Views

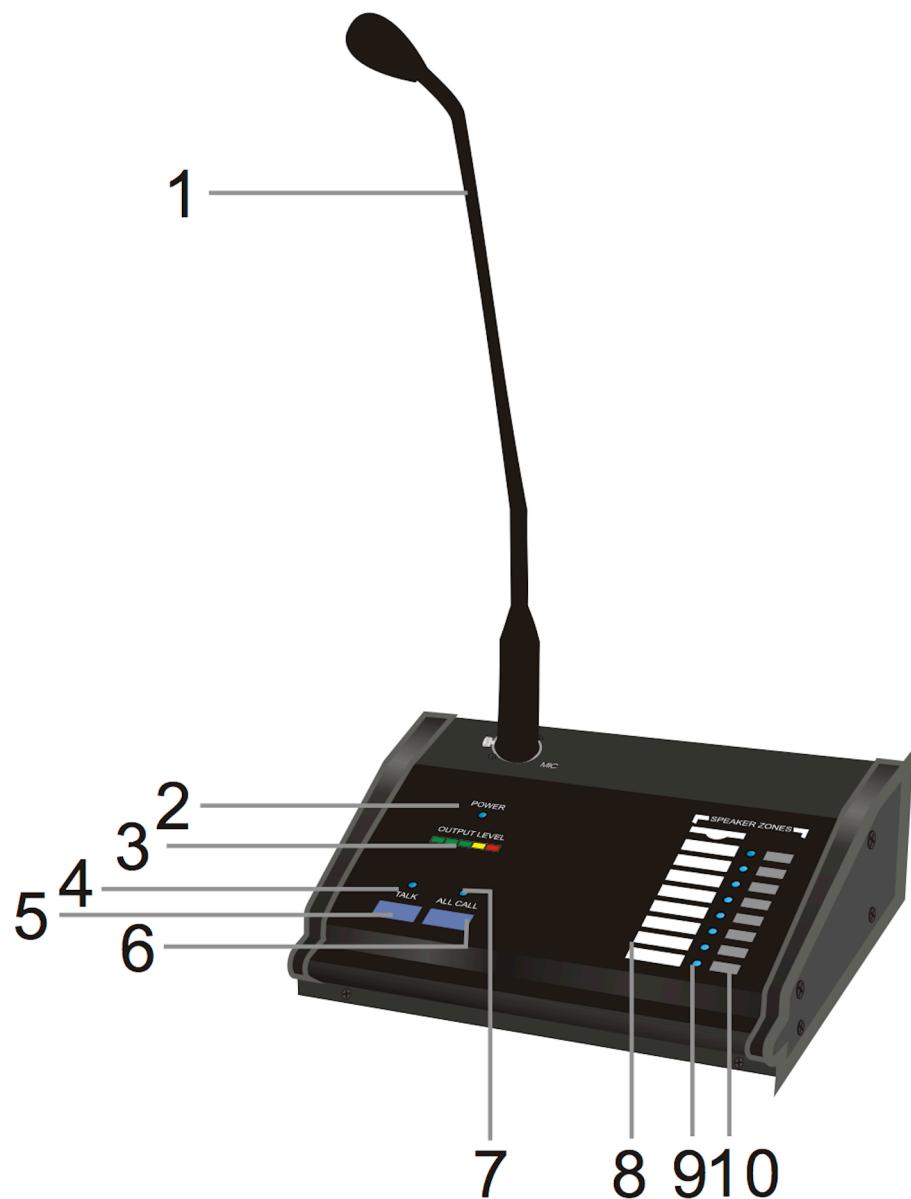


Figure 3.1: T-8000A - Front View

Front Panel	
1	Gooseneck Microphone
2	Power Indicator
3	Output Levelmeter
4	Talk Indicator
5	Talk Button
6	All Call Button
7	All Call Indicator
8	Zone Labels
9	Zone Indicator
10	Zone Select Buttons

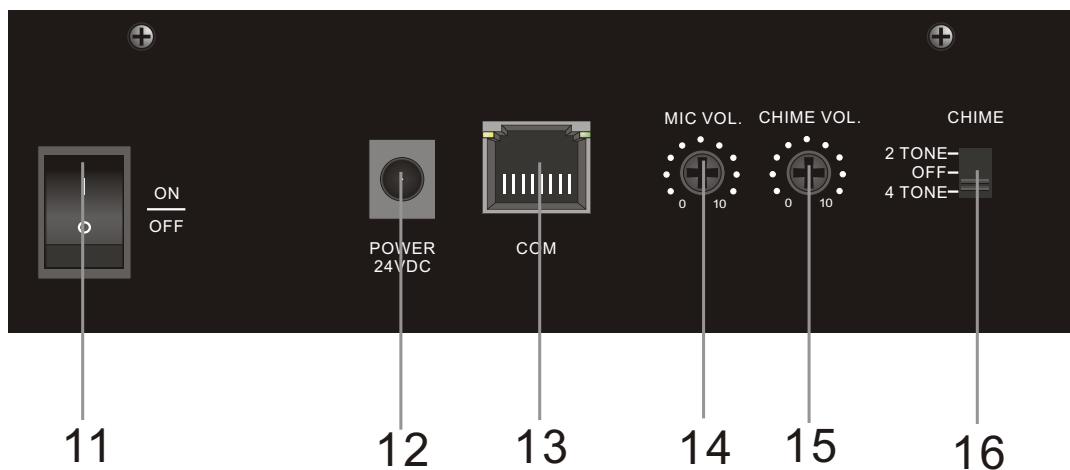


Figure 3.2: T-8000A - Rear View

Rear Panel

11	Power Switch
12	Power Input 24 V DC
13	Communication Port (refer to section 2)
14	Volume Microphone
15	Volume Chime
16	Chime: 2-Tone, 4-Tone, Off

3.4 Operation

To activate a call a destination (one or several zones) needs to be selected by using the zone keys or the *ALL CALL* key. A selected zone can be de-selected with the same key.

The zone LED will indicate the condition:

LED	Condition
off	Zone not selected
blue	Zone selected and available
orange	Zone selected and occupied

After selecting the desired zone, the announcement may be started by pressing the *TALK* key. The key needs to be held down during the announcement. A blinking LED indicates that the zone had not been selected.

3.5 Technical Data

T-8000A	
Microphone Type	Condensor
Phantom Power	12 V
Frequency Response	80 Hz - 18 kHz
Supply Voltage	24 V DC /65 mA
Weight	1.25 kg
Dimensions (D x W x H)	180 x 143 x 61 mm

4 T-8000AE Extension Control Keypad

4.1 General Information

The keypad extension T-8000AE adds eight additional zone selection keys to the paging station T-8000A ([section 3](#)).

Up to three extensions can be connected to the paging station. The power supply is provided by the paging station.

4.2 View



Figure 4.1: T-8000AE - Front View

Front Panel	
1	Zone Labels
2	Zone Indicator
3	Zone Select Buttons

4.3 Connection

The keypad extension is connected to the paging station via a 10 pin ribbon cable (included), which also provides power.

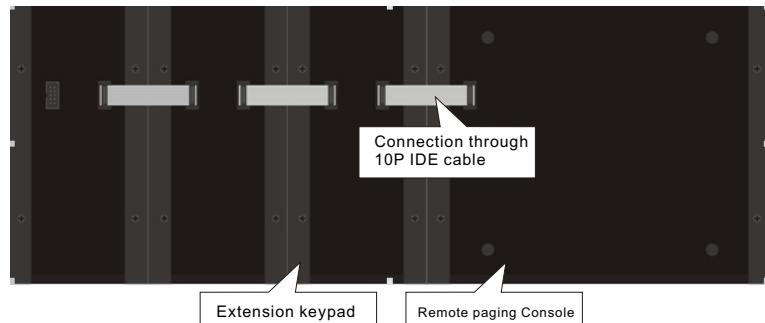


Figure 4.2: T-8000AE - Connection Diagram

Up to three keypad extensions can be connected to a paging station. Every extension requires a unique ID, which is set by the DIP switchees on the rear:

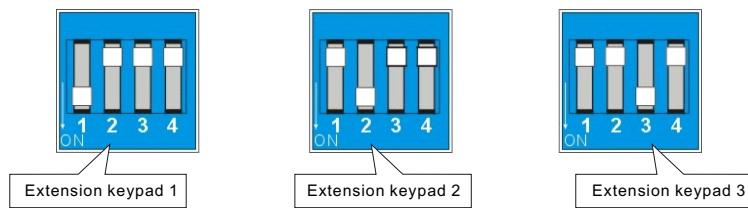


Figure 4.3: T-8000AE - DIP Schalter

4.4 Technical Data

T-8000AE	
Supply Voltage	24 V DC /10 mA
Weight	525 g
Dimensions (D x W x H)	180 x 70 x 61 mm

5 T-8000B/T-8000BW Remote Control with Audio Input

5.1 General Information

The remote controls T-8000B and T-8000BW are designed to work with the T-8000 8x8 Audio Matrix. They offer selection of the audio source, volume control and two local audio inputs (microphone and line levels).

5.2 Features

- Connection to the central unit via CAT-5
- Aluminium (type B), white (type BW) surface
- Each remote control module offers one RJ-45 interface
- Transmission audio, 24 V DC and RS-485 control data via CAT-5
- RCA and XLR audio inputs with volume control
- Setup of system volume
- 24 V DC provided by central control
- Interface for external 24 V DC for distances of > 50 m
- Metal mounting box

5.3 Views

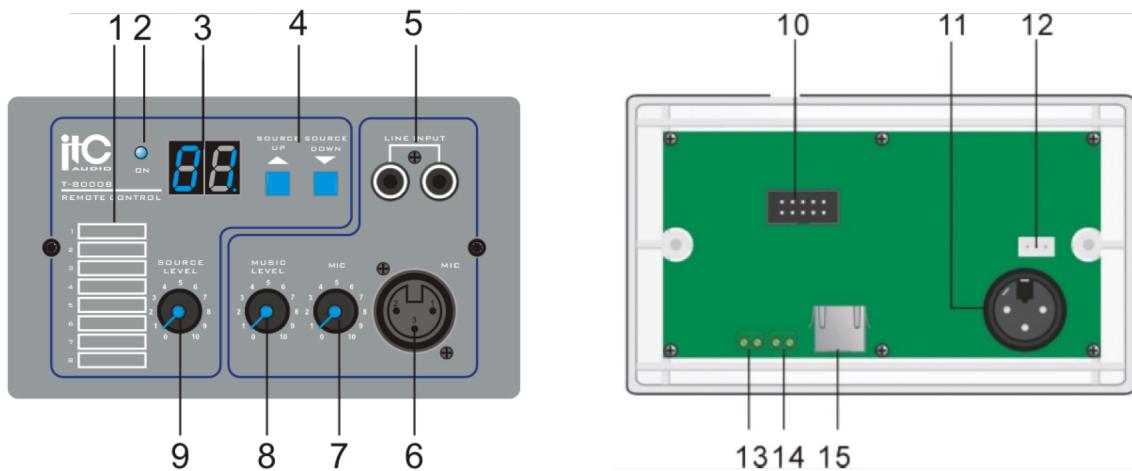


Figure 5.1: T-8000B - Front and Rear View

Front & Rear	
1	Zone Labels
2	Power Indicator
3	Alphanumeric Display of Audio Source (refer to section 2.6)
4	Source Selector for the Zone (refer to section 2.6)
5	Local Line Input
6	Local Microphone Input
7	Volume Microphone
8	Volume Line
9	Volume Source of T-8000 Unit
10	Service Connector
11	Microphone XLR
12	Microphone PCB
13	Audio Output
14	Power 24 V DC
15	Communication Port (refer to section 2)

5.4 Technical Data

T-8000B /T-8000BW	
Microphone Input	Sensitivity: 10 mV /600 Ohms S/N: > 65 dB Frequency Response: 80 Hz - 18 kHz
Line-Input	335 mV /47 kOhms S/N: > 75 dB Frequency Response: 20 Hz - 20 kHz
THD	< 0,1 %
Power	24 V DC (for distances > 50 m)
Dimensions	146 x 86 x 33 mm
Weight	153 g

6 T-60BU/120BU/240BU USB Mixer Amplifier

6.1 General Information

The USB mixer amplifier offers 60, 120, and 240 W output power. Each amplifier is equipped with three microphone inputs, two AUX inputs, one EMC priority contact input and an USB port.

Muting of all available channels via the EMC contact input, except microphone 1.

Independent volume control of microphone 1–3 and AUX 1–2. Master tone control and system volume.

70 V, 100 V and 4–16 Ohms outputs. Including remote control.

6.2 Features

- USB interface (media play)
- Fluorescent display of selected title
- Four control keys for media play
- Remote control included: Play, EQ, Volume and Mute
- Three balanced microphone inputs
- Mixer for BGM and announcements
- 2 RU
- 70 V, 100 V and 4–16 Ohms outputs
- 3 microphone inputs (TSR)
- Microphone 1 with priority and attenuator
- EMC Input

6.3 Views

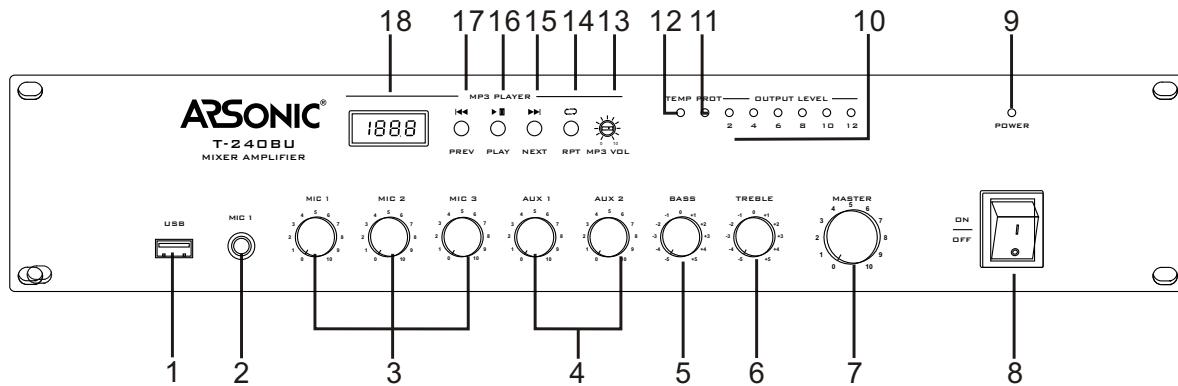


Figure 6.1: T-BU Series - Front View

Front Panel

1	USB Connector
2	Mic 1 Input
3	Mic 1-3 Gain
4	Aux 1-2 Gain
5	Tone Control Bass
6	Tone Control Treble
7	Mix Volume
8	Power Switch
9	Power Indicator
10	Levelmeter
11	Protect Indicator
12	Temperature
13	MP3 Volume
14	Loop Play
15	Next Title
16	Play/Pause
17	Previous Title
18	Time Display

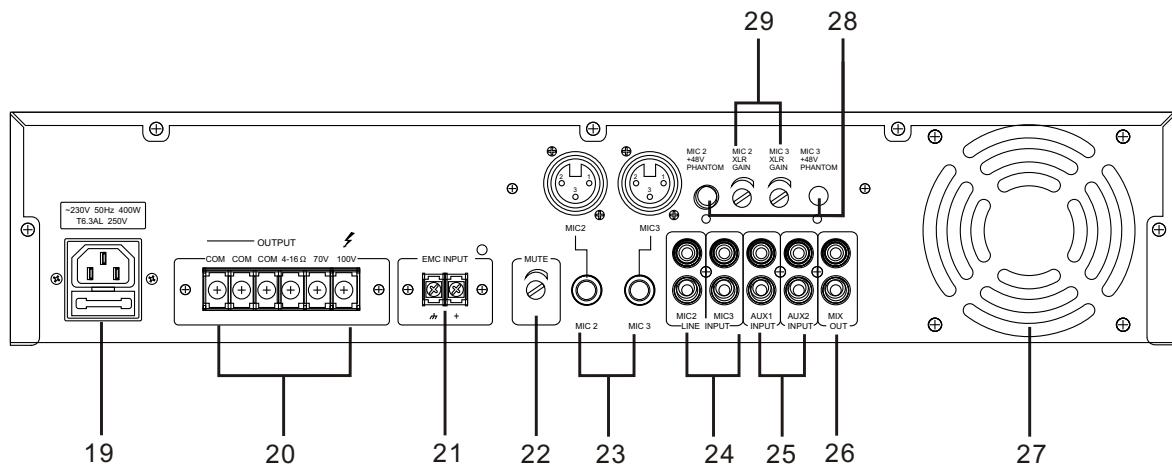


Figure 6.2: T-BU - Rear View

Rear Panel	
19	Mains
20	Loudspeaker Output (refer to section 6.4)
21	Alarm Signal Input
22	Attenuator (refer to section 6.5)
23	Inputs Mic 2 and 3
24	Inputs Line 2 and 3
25	Inputs Aux 1 and 2
26	Output Mix
27	Fan
28	Phantom Power On/Off Mic 2 and 3
29	Gain XLR Inputs Mic 2 and 3

6.4 Speaker Connections

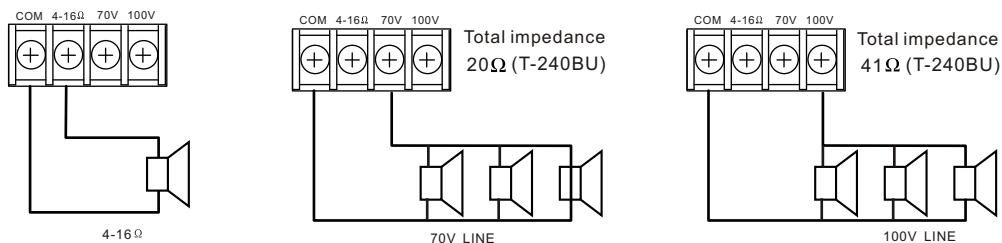


Figure 6.3: T-BU Series - Speaker Connection



Caution

The low impedance, 70V and 100V outputs cannot be used simultaneously.

OUTPUT TERMINAL SAFETY WARNING! Do not touch output terminals while amplifier power is on. Make all connections with the amplifier disconnected from mains. Risk of hazardous energy!

6.5 Priority Paging

Microphone 1 has top priority. An announcement signal will duck all other audio channels. The amount of ducking can be set on the backside of the unit from 0 to 30 dB.

6.6 Connection Diagram

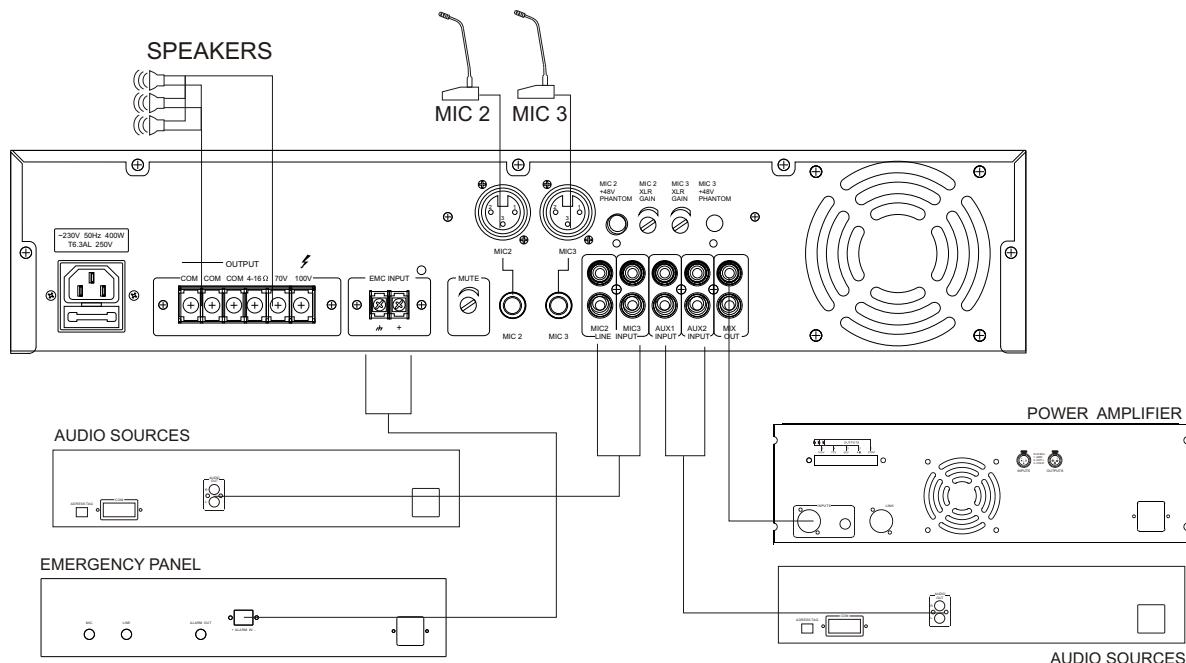


Figure 6.4: T-BU Series - Connection Diagram

6.7 Technical Data

T-60BU /T-120BU /T-240BU	
Output Power	T-60BU: 60 W T-120BU: 120 W T-240BU: 240 W
Loudspeaker Outputs	4–16 Ohms, 70/100 V
Inputs	MIC 1: 5 mV (600 Ohms) bal. TRS MIC 2–3: 5 mV /600 Ohms bal. TRS and XLR LINE: 775 mV /10 kOhms, unsym. RCA AUX 1–2: 350 mV /10 kOhms, unbal. RCA
Phantom Power	48 V switchable
Tone Control Bass	+/- 10dB @ 100Hz
Tone Control Treble	+/- 10dB @ 10kHz
Frequency Response	50 Hz - 16 kHz
S/N	MIC 1, 2, 3: > 66 dB AUX 1, 2: > 80 dB
THD	< 0.1 % @ 1 kHz, 1/3 Output Power
Crosstalk	MIC: < 80 dB AUX: < 85 dB
USB	Up to 8 GB
Mains	230 V AC, 50 Hz
Power Consumption	T-60BU: 100 W T-120BU: 200 W T-240BU: 400 W
Dimensions	484 x 329 x 88 mm
Weight	T-60BU: 7.2 kg T-120BU: 10.0 kg T-240BU: 17.5 kg

7 TI-60BU/120BU/240BU Five Zone USB Mixer Amplifier

7.1 General Information

The USB mixer amplifier provides 60, 120 and 240 W output power. It offers three microphone inputs, two AUX inputs, one contact input and a USB port.

Muting of all available channels via the EMC contact input, except microphone 1.

Independent volume control of microphone 1–3 and AUX 1–2. Master tone control and system volume.

70 V, 100 V and 4–16 Ohms outputs. Including remote control.

7.2 Features

- USB interface (media play)
- Fluorescent display of selected title
- Four control keys for media play
- Remote control included: Play, EQ, Volume and Mute
- Three balanced microphone inputs
- Mixer for BGM and announcements
- 2 RU
- 70 V, 100 V and 4–16 Ohms outputs
- 5 Zone outputs
- 3 microphone inputs (TSR)
- Microphone 1 with priority and attenuator
- EMC Input

7.3 Views

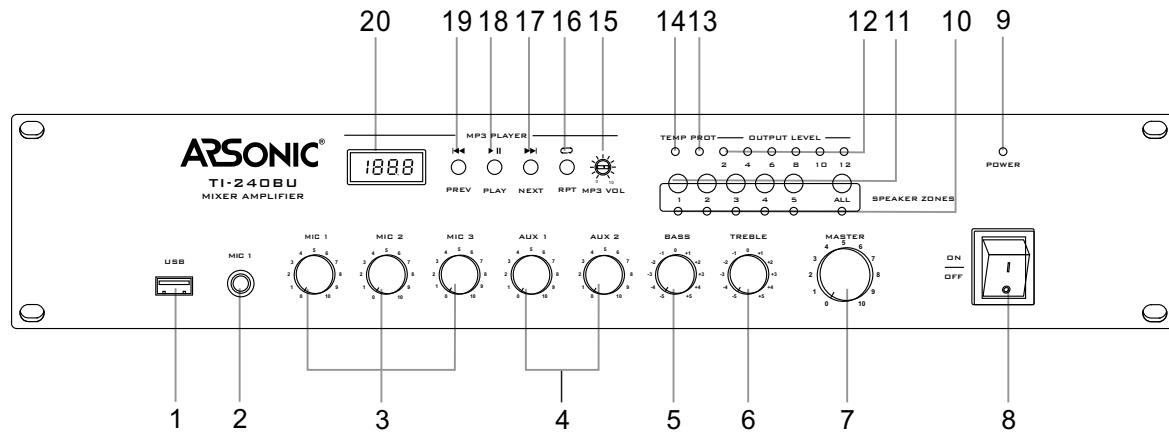


Figure 7.1: TI-BU Series - Front View

Front Panel	
1	USB Connector
2	Mic 1 Input
3	Mic 1-3 Gain
4	Aux 1-2 Gain
5	Tone Control Bass
6	Tone Control Treble
7	Mix Volume
8	Power Switch
9	Power Indicator
10	Zone Indicators
11	Zone Selector
12	Levelmeter
13	Protect Indicator
14	Temperature
15	MP3 Volume
16	Loop Play
17	Next Title
18	Play/Pause
19	Previous Title
20	Time Display

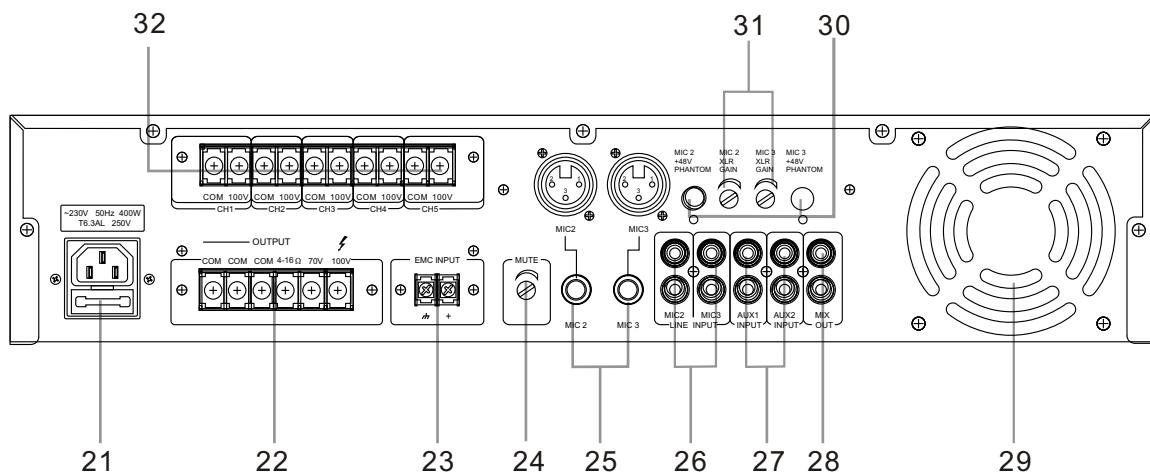


Figure 7.2: TI-BU - Rear View

 Rear Panel

- 21 Mains
- 22 Loudspeaker Output (refer to [section 6.4](#))
- 23 Alarm Signal Input
- 24 Attenuator (refer to [section 6.5](#))
- 25 Inputs Mic 2 and 3
- 26 Inputs Line 2 and 3
- 27 Inputs Aux 1 and 2
- 28 Output Mix
- 29 Fan
- 30 Phantom Power On/Off Mic 2 and 3
- 31 Gain XLR Inputs Mic 2 and 3
- 32 Zone Outputs (refer to [section 7.6](#))

7.4 Speaker Connections

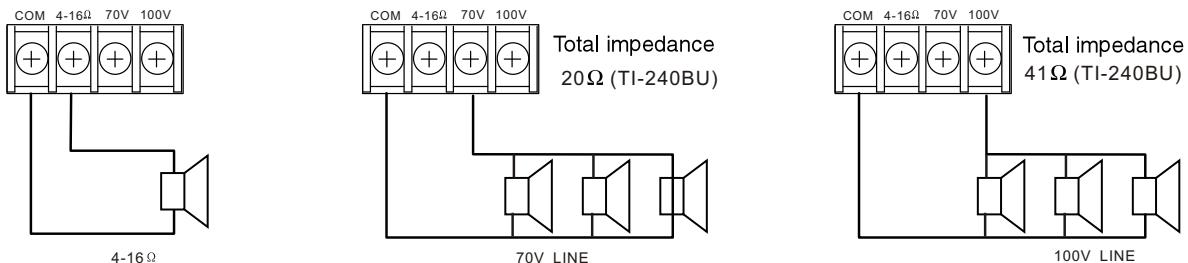


Figure 7.3: TI-BU Series - Speaker Connection


Caution

The low impedance, 70V and 100V outputs cannot be used simultaneously.

OUTPUT TERMINAL SAFETY WARNING! Do not touch output terminals while amplifier power is on. Make all connections with the amplifier disconnected from mains. Risk of hazardous energy!

7.5 Priority Paging

Microphone 1 has top priority. An announcement signal will duck all other audio channels. The amount of ducking can be set on the backside of the unit from 0 to 30 dB.

7.6 Zone Select

The individual zone is activated by pressing the zone selector. It is possible to select several zones simultaneously.

The *ALL* key activated all zones independant of the setting of the individual zone selectors.



Caution

The mixing output is always active and independent of the selected zone.

7.7 Connection Diagram

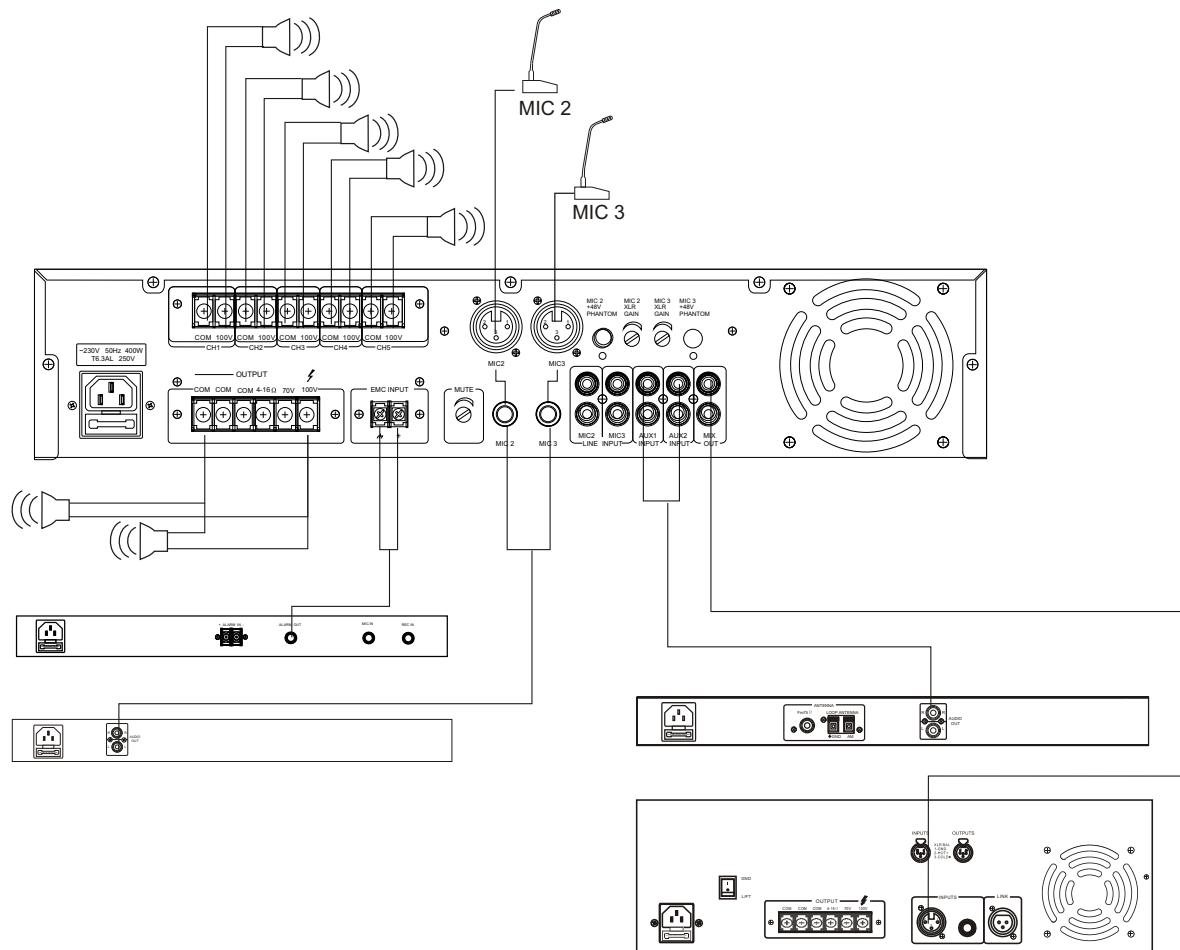


Figure 7.4: TI-BU Series - Connection Diagram

7.8 Technical Data

TI-60BU /TI-120BU /TI-240BU	
Output Power	TI-60BU: 60 W TI-120BU: 120 W TI-240BU: 240 W
Loudspeaker Outputs	4-16 Ohms, 70/100 V
Inputs	MIC 1: 5 mV (600 Ohms) bal. TRS MIC 2-3: 5 mV /600 Ohms bal. TRS and XLR LINE: 775 mV /10 kOhms, unbal. RCA AUX 1-2: 350 mV /10 kOhms, unsym. RCA
Phantom Power	48 V switchable
Tone Control Bass	+/- 10dB @ 100Hz
Tone Control Treble	+/- 10dB @ 10kHz
Frequency Response	50 Hz - 16 kHz
S/N	MIC 1, 2, 3: > 66 dB AUX 1, 2: > 80 dB
THD	< 0.1 % @ 1 kHz, 1/3 Output Power
Crosstalk	MIC: < 80 dB AUX: < 85 dB
USB	Up to 8 GB
Mains	230 V AC, 50 Hz
Power Consumption	T-60BU: 100 W T-120BU: 200 W T-240BU: 400 W
Dimensions	484 x 329 x 88 mm
Weight	T-60BU: 7.2 kg T-120BU: 10.0 kg T-240BU: 17.5 kg

8 TI-120S/240S/350S Five Zone Mixer Amplifier

8.1 General Information

This mixer amplifier offers a small PA system in a compact design. It allows for the individual volume control of the five zone outputs.

The TI-S mixer amplifier provides 70 V, 100 V and low impedance (4–8 Ohm) outputs, four microphone inputs (1/4" and XLR) and two RCA audio inputs as well as a telephone and a contact input (EMC).

The six inputs (MIC and line level) offer independent volume and tone control. The paging microphone T-318 provides control and paging into the five zones.

8.2 Features

- Seven inputs and five zones
- Output power: 120 W, 240 W und 350 W
- 70 V, 100 V and low impedance connectors (4–8 Ohm)
- Paging into five individual and all zones
- Four balanced microphone inputs with switchable phantom power
- Two RCA signal inputs, telephone input and contact input (EMC)
- Separate volume control for each zone
- Pre-chime and siren implemented
- Five levels of priority
- REC output for tape recorder
- 230 V AC and 24 V DC operation
- 3 RU

8.3 Views

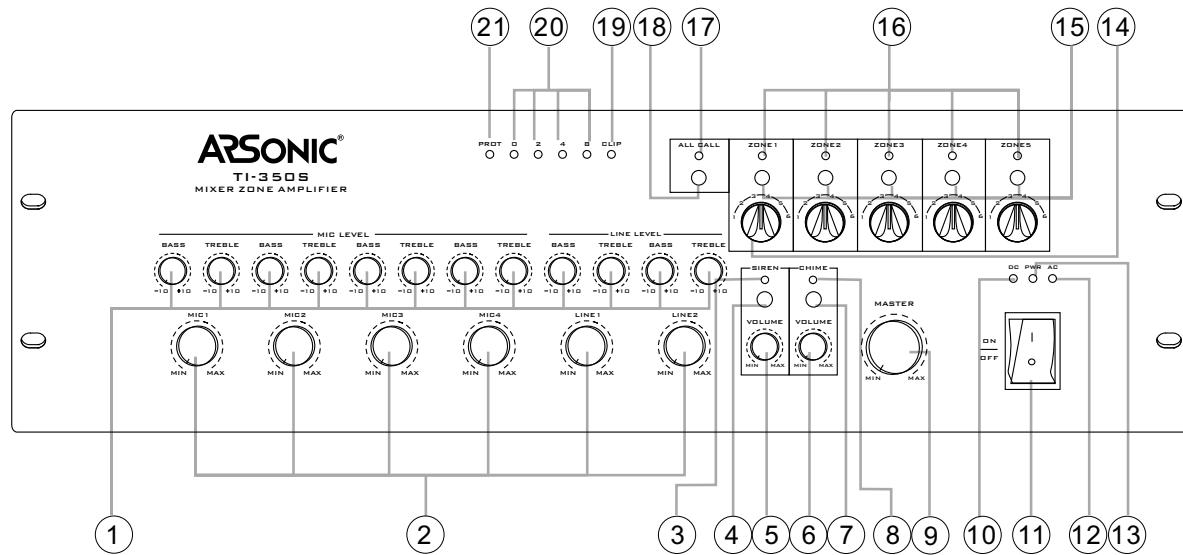


Figure 8.1: TI-S Series - Front View

Front Panel

1	Tone Control (Bass/Treble) per Channel
2	Volume per Channel
3	Alarm Indicator
4	Alarm On/Off
5	Alarm Volume
6	Pre-chime Volume
7	Pre-chime On/Off
8	Pre-chime Indicator
9	Master Volume
10	24V DC Indicator
11	Power Switch
12	230V AC Indicator
13	Power Indicator
14	Volume per Zone (refer to section 8.5)
15	Zone Selector Button
16	Zone Selector Indicator
17	All Call Indicator
18	All Call Button
19	Clip Indicator
20	Levelmeter
21	Protect Indicator

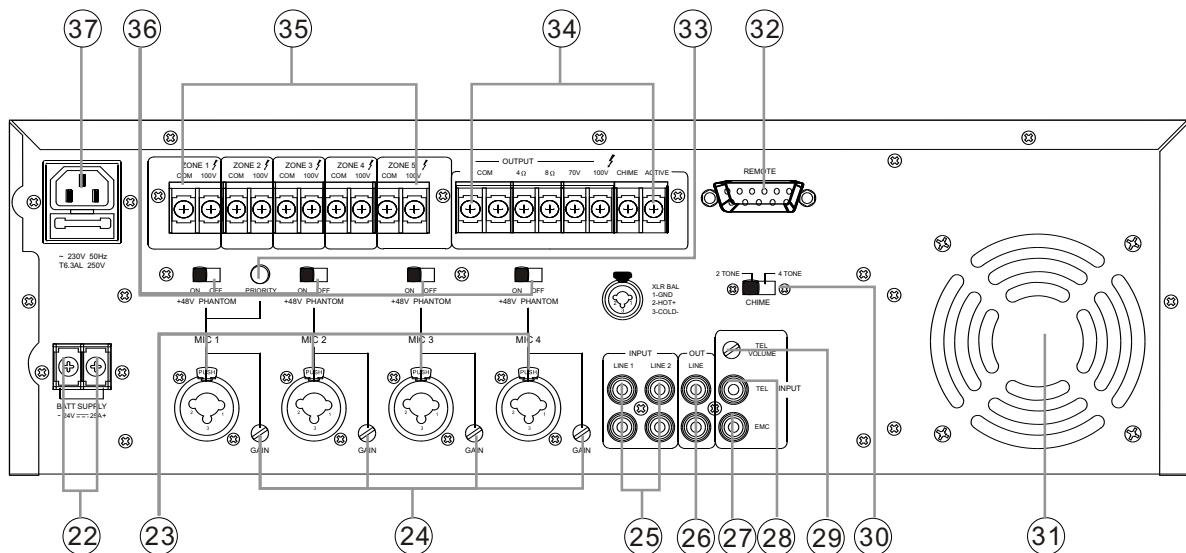


Figure 8.2: TI-S - Rear View

Rear Panel

- 22 24V DC Backup Power (up to 50 A)
- 23 Microphone Inputs 1-4
- 24 Gain Microphone 1-4
- 25 Line Inputs 1-2
- 26 Line Outputs (e.g. for Record)
- 27 Audio Input Paging
- 28 Audio Input Telephone
- 29 Volume Telephone Input
- 30 Selector 2- or 4-Chime-Gong
- 31 Fan
- 32 Paging Microphone
- 33 Priority Button Microphone 1
- 34 Loudspeaker Output (refer to [section 8.4](#))
- 35 Zone Outputs
- 36 Phantom Power On/Off
- 37 Mains

8.4 Speaker Connections

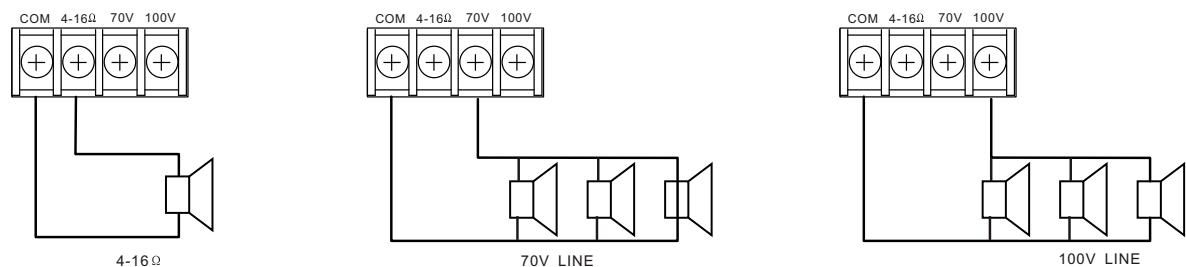


Figure 8.3: TI-S Series - Speaker Connection

**Caution**

The low impedance, 70V and 100V outputs of the master cannot be used simultaneously.
OUTPUT TERMINAL SAFETY WARNING! Do not touch output terminals while amplifier power is on. Make all connections with the amplifier disconnected from mains. Risk of hazardous energy!

8.5 Volume of Zone

Each zone has a volume switch with 6 positions:

Position	Damping	Voltage
6	0 dB	100 V
5	3 dB	66 V
4	6 dB	50 V
3	12 dB	25 V
2	18 dB	12 V
1	24 dB	6 V

8.6 Connection of Paging Microphone

The paging microphone T-318 (refer to [section 15](#)) interconnects with a 15 pin 1-to-1 cable. The layout is as follows:

Pin	Function
1	Audio Input Plus
2	Audio Input Minus
3	Audio Input Ground
4	Contact Input Zone 1
5	Contact Input Zone 2
6	Contact Input Zone 3
7	Contact Input Zone 4
8	Contact Input Zone 5
9	Common Ground Contact Inputs
10	+24V DC
11-15	n/a

8.7 Connection Diagram

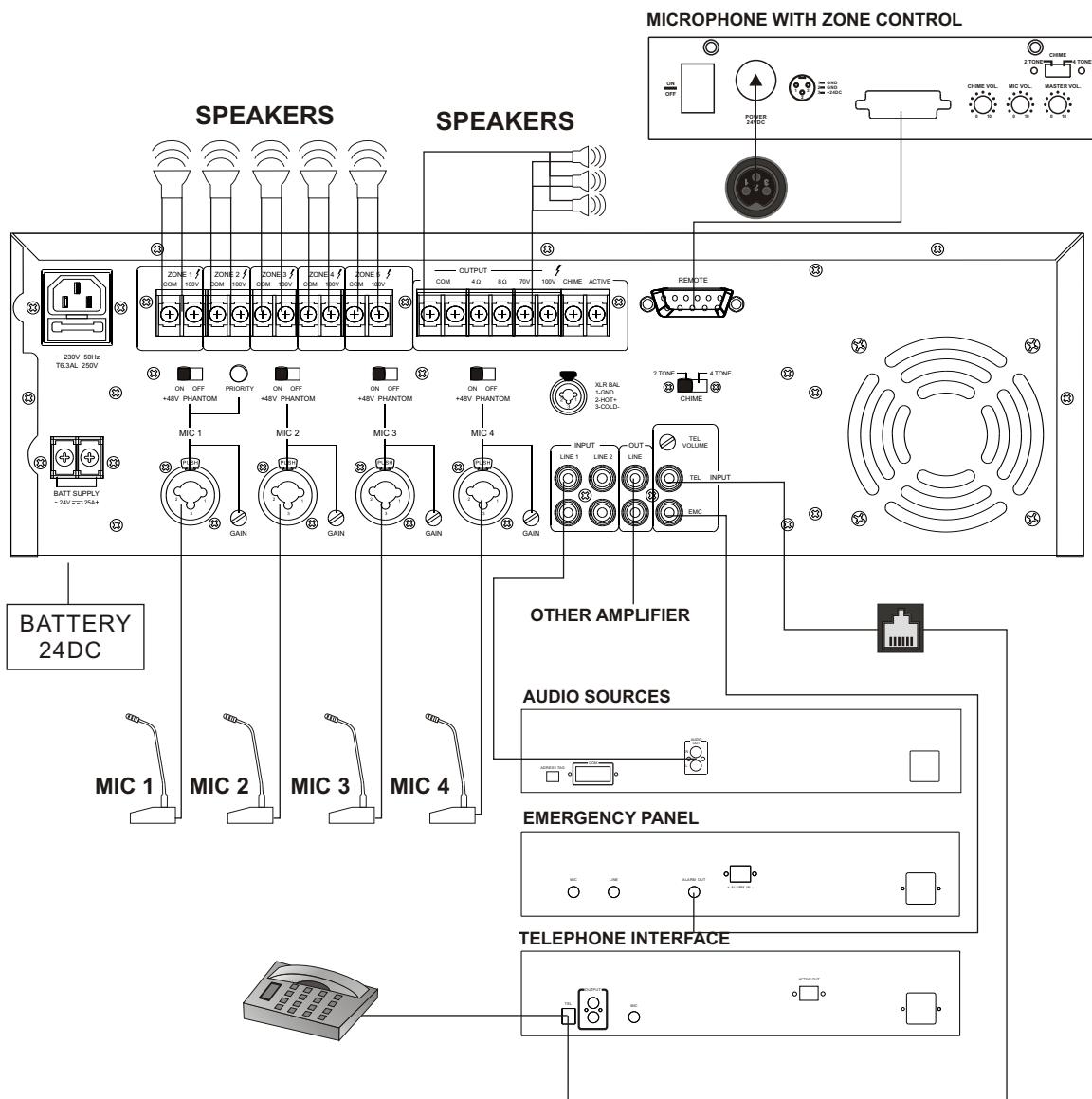


Figure 8.4: TI-S Series - Connection Diagram

8.8 Technical Data

TI-120S /TI-240S /TI-350S	
Output Power	TI-120S: 120 W TI-240S: 240 W TI-350S: 350 W
Loudspeaker Outputs	4-8 Ohms, 70/100 V
Microphone Inputs 1-4	Sensitivity: 5 mV /600 Ohms bal. TRS and XLR S/N: > 55 dB Frequency Response: 50 Hz - 16 kHz Phantom Power: 48 V switchable
Line Inputs 1-2	775 mV /10 kOhms, unbal. RCA S/N: > 65 dB Frequency Response: 50 Hz - 16 kHz
Telephone Audio Input	775 mV /10 kOhms, unbal. RCA S/N: > 65 dB Frequency Response: 50 Hz - 16 kHz
THD	< 0.1 % @ 1 kHz, 1/3 Output Power
Tone Control Bass	+/- 10dB @ 100Hz
Tone Control Treble	+/- 10dB @ 10kHz
Mains	230 V AC, 50 Hz
Backup Power	24 V DC
Power Consumption	TI-120S: 180 W TI-240S: 320 W TI-350S: 500 W
Dimensions	484 x 425 x 132 mm
Weight	TI-120S: 16.9 kg TI-240S: 20.2 kg TI-350S: 22.4 kg

9 T-4060MP/4120MP Four Zone Mixer Amplifier

9.1 General Information

The 4 channel mixer amplifier provides 60 and 120 W output power per channel. The matrix inputs and outputs can be selected to provide a 5x4 mixing matrix with an integrated MP3 player.

Ideal for hotels, shopping malls, fitness centers, entertainment centers, etc.

True 5x4 mixing matrix with priority paging and versatile extensibility of zone sizes.

9.2 Features

- Four zone outputs to external equipment like power amplifiers
- Four channel amplifier outputs with 60 /120 W each channel, gain level meter and monitor selector
- 70V, 100V, 4 Ohm outputs selectable
- 5 x 4 mixing matrix
- Three line/microphone inputs with phantom power
- MP3/Radio player with remote control and USB/SD input
- 2 AUX inputs (RCA) for connection of external equipment (CD, etc.)
- RJ-45 port for connection of remote mic station T-4012
- Telephone paging input
- Priority contact
- RS-232 communication port
- Monitor output with 1 W, 8 Ohm for connection of small monitor loudspeaker
- 5 channels with gain, treble, bass control, zone selection

9.3 Views

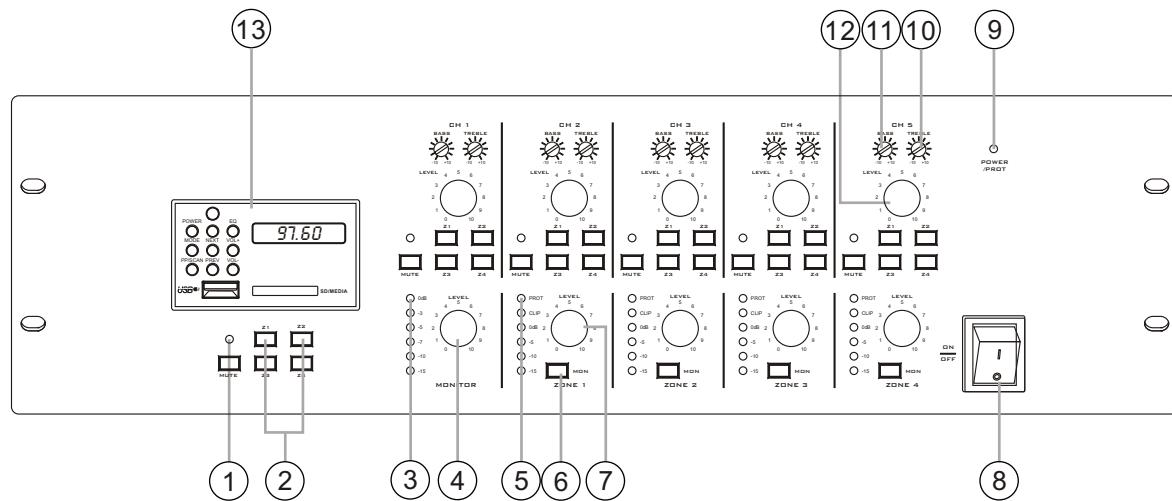


Figure 9.1: T-MP Series - Front View

Front Panel

1	Mute MP3-Player with Status Indicator
2	Zone Selector (refer to section 9.7)
3	Levelmeter Monitoring
4	Volume Monitoring
5	Levelmeter Zone
6	Zone Select for Monitoring
7	Volume Zone Amplifier
8	Power Switch
9	Power Indicator
10	Tone Control Treble
11	Tone Control Bass
12	Volume Audio Input
13	MP3/Radio Player

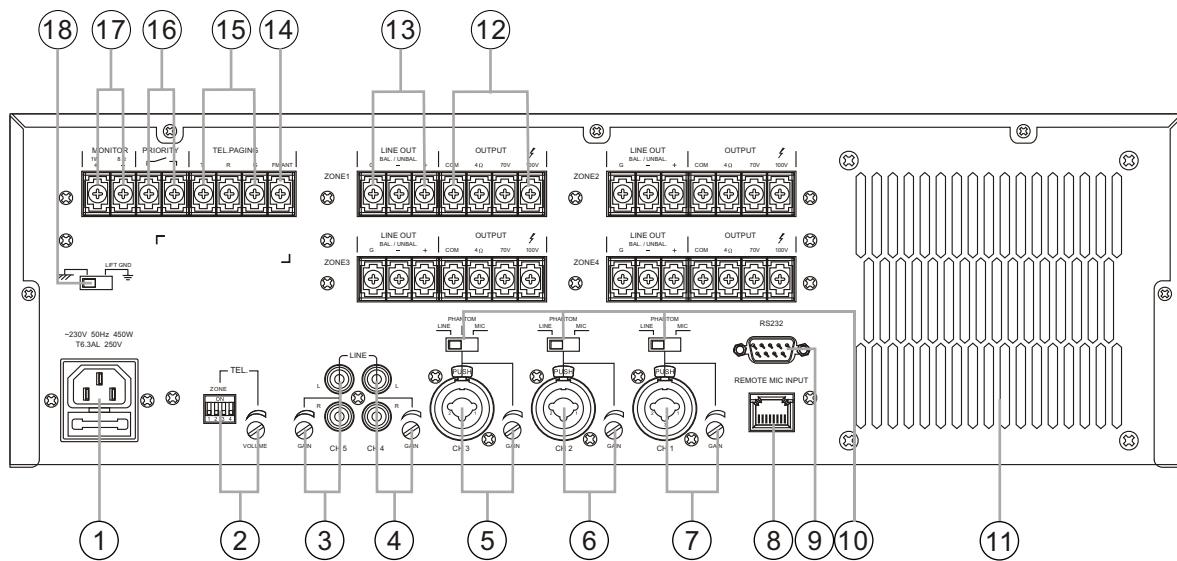


Figure 9.2: T-MP Series - Back View

Back Panel	
1	Mains
2	Telephone Volume and Zone Selector
3	Audio Input 5 with Gain
4	Audio Input 4 with Gain
5	Microphone Input 3 with Gain
6	Microphone Input 2 with Gain
7	Microphone Input 1 with Gain
8	Connection Paging Microphone
9	RS232 Port
10	Mode of Operation Inputs 1-3 (refer to section 9.4)
11	Fan
12	Loudspeaker Output (refer to section 9.5)
13	Line Audio Output Zone
14	Radio Antenna
15	Audio Input Telephone
16	Contact Input Priority (refer to section 9.8)
17	Loudspeaker Output Monitoring (refer to section 9.6)
18	Ground Lift (refer to section 9.9)

9.4 Mode of Operation Inputs 1–3

The mode of operation for the audio inputs 1–3 can be selected by a switch on the rear of the unit:

- Microphone without phantom power
- Microphone with phantom power
- Line

9.5 Speaker Connections

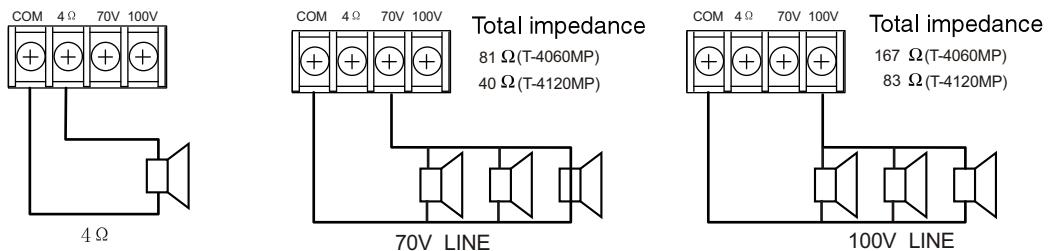


Figure 9.3: T-MP Series - Speaker Connection



Caution

The low impedance, 70V and 100V outputs cannot be used simultaneously.

OUTPUT TERMINAL SAFETY WARNING! Do not touch output terminals while amplifier power is on. Make all connections with the amplifier disconnected from mains. Risk of hazardous energy!

9.6 Monitor Output

The T-8000 provides built-in amplifier with a low impedance monitor output. The output power is 1 watt at 8 ohms.

9.7 Zone Select

Each the audio inputs 1–5 and the MP3/Radio player provide a block of 4 buttons to route their audio signal to the corresponding zones. It is possible to select several zones simultaneously.

9.8 Priority Mute

Different priorities apply to the audio sources:

	Priority	Source
1	High	Microphone 1
2	...	Telephone Input
3	Low	External Paging Microphone

The contact input on the rear of the unit (Point 16 of [section 9.3](#)) grants priority to the external paging station.

9.9 Ground Lift

The chassis ground of the amplifier is connected with the ground of the AC power cord (the non-fused earthed protective conductor). Therefore, if several devices are connected in a signal chain a ground loop may be created. This ground loop will cause a compensating current to travel on the shields of the audio cables causing hum-problems.

The amplifiers of the T-MP series are equipped with a *Ground Lift* switch on the back side of the unit.

It has two settings:

Character	Signification/meaning
	Signal ground (Audio) is separated from chassis ground
	Signal ground (Audio) is connected to chassis ground



Caution

Although *Ground Lift* is a common and proven method, proper labeling and grounding should avoid hum in the first place.

Isolating the ground of the AC power cord is technically different and eliminates the protective earth connection. Therefore, **NEVER** isolate the ground of the AC power as this may pose a serious danger to your life.

9.10 Technical Data

T-4060MP / T-4120MP	
Output Power	T-4060MP: 4x 60 W T-4120MP: 4x 120 W
Loudspeaker Outputs	4 Ohms, 70/100 V
Monitor Output	1 W / 8 Ohms
Microphone Inputs 1-3	Sensitivity: 2.5 mV / 600 Ohms bal. TRS and XLR Phantom Power: 48 V switchable
Line Inputs 5-6	350 mV / 10 kOhms, unbal. RCA
Telephone Audio Input	350 mV / 10 kOhms, terminal
Line Outputs 1-4	1 V / 600 Ohms, bal.
S/N	> 65 dB
Frequency Response	50 Hz - 18 kHz
THD	< 0.1 % @ 1 kHz, 1/3 Output Power
Tone Control Bass	+/- 10dB @ 100Hz
Tone Control Treble	+/- 10dB @ 10kHz
Mains	230 V AC, 50 Hz
Power Consumption	T-4060MP: 375 W T-4120MP: 750 W
Dimensions	484 x 440 x 132 mm
Weight	T-4060MP: 8.1 kg T-4120MP: 11.7 kg

10 T-2S01 Stereo Mixer Pre-Amplifier

10.1 General Information

The T-2S01 is a mixer pre-amplifier to suit public address applications like in schools, offices, shops and many more.

The T-2S01 is designed to operate with the paging microphone T-319 (refer to [section 16](#)).

10.2 Features

- 10 in /2 out mixer pre-amplifier
- Ten microphone inputs with highpass filters
- 4 separate Line Inputs (stereo, RCA)
- Paging microphone T-319 ([section 16](#)) acts as MIC 1 with highest priority
- Priority and phantom power for MIC 2–4
- Record output (stereo, RCA)
- 2-/4-tone chime, trigger input and trigger key
- Selectable output for each input (output 1, 2 or 1 & 2)
- Volume control for chime, MIC 1, inputs 2–10, outputs 1 & 2
- Tone control for outputs 1 & 2
- Indicators for input 1–10, power, 2-channel level meter
- Power supply: 230 V AC and 24 V DC

10.3 Views

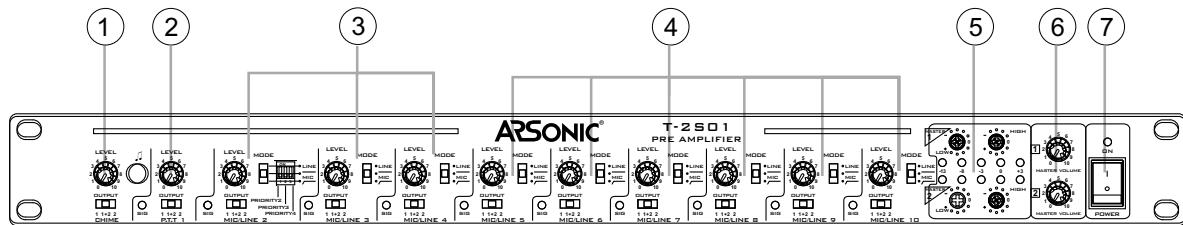


Figure 10.1: T-2S01 - Front View

Front Panel

- 1 Pre-chime: Trigger Button, Volume and Output Selector
- 2 Mic 1: Volume, Clip-Indicator and Output Selector
- 3 Mic/Line 2–4: Volume, Clip-Indicator, Output Selector, Mode of Operation (refer to [section 10.4](#)) and Priority (refer to [section 10.5](#))
- 4 Mic/Line 5–10: Volume, Clip-Indicator, Output Selector and Mode of Operation (refer to [section 10.4](#))
- 5 Tone Control (Bass/Treble) and Levelmeter
- 6 Volume Master Outputs 1 and 2
- 7 Power Switch

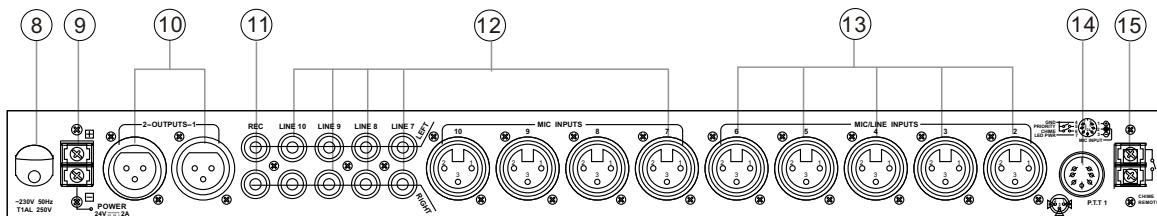


Figure 10.2: T-2S01 - Rear View

Rear Panel

- 8 Mains
- 9 Backup Power 24 V DC
- 10 Master Outputs 1 and 2
- 11 Record Outputs
- 12 XLR/RCA Inputs 7–10
- 13 XLR Inputs 2–6
- 14 PTT Input 1 (refer to [section 16.4](#))
- 15 Contact Input Pre-chime

10.4 Mode of Operation Inputs 2–10

The *Mode* switch on the front panel sets the operation mode for the channels 2 to 10:

- Microphone
- Microphone with High Pass Filter
- Line



Caution

The two microphone operation modes automatically activate the phantom power.

The *Output* switch determines the destinations/outputs of the input signal:

- Channel 1
- Channel 1+2
- Channel 2



Caution

If a stereo signal is applied to the RCA input jacks, both channels are mixed and send to either channel 1 or 2, depending on the setting of the output switch. Setting 1+2 will retain the stereo signal.

10.5 Priority Paging

The inputs 2 to 4 contain a priority setting that can be individually activated by the DIP switch on the front of the device.

If an audio signal is applied, the priority of the corresponding input channels is activated and channels 5 to 10 are muted.

10.6 Connection Diagram

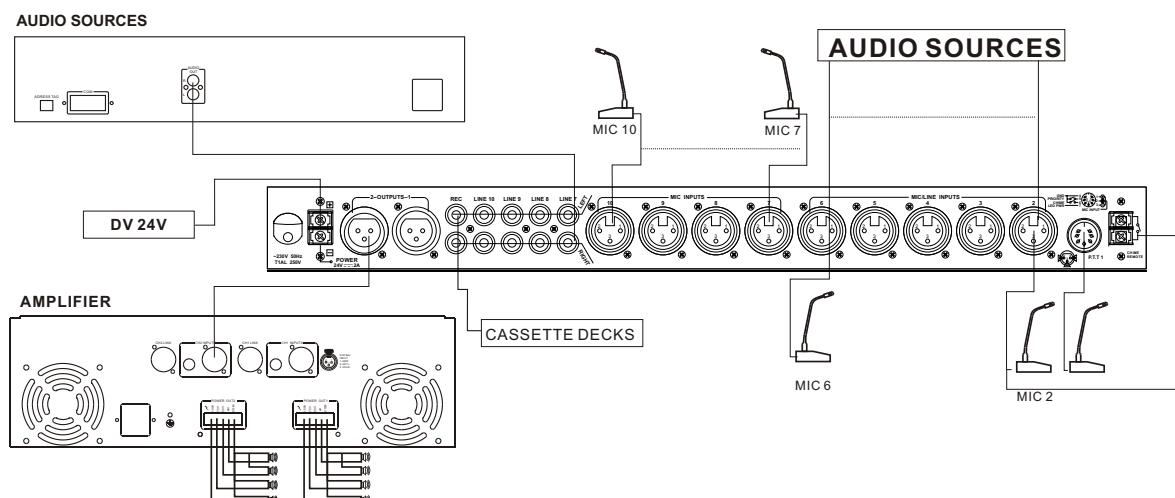


Figure 10.3: T-2S01 - Connection Diagram

10.7 Technical Data

T-2S01	
Input Sensitivity	MIC/LINE: -5 dBu (5 kOhms bal.) LINE RCA: -10 dBu (10 kOhms bal.)
Output Level	MASTER 1,2: +4dBu (200 Ohms bal.) REC: 0 dBu (10 kOhms unbal.)
Frequency Response	20 Hz - 20 kHz (-0.5 dB)
S/N	MIC: > 60 dB LINE: > 0.03 %
Crosstalk	MIC: > 60 dB LINE: > 75 dB
Power Consumption	13 W
Mains	230 V AC /50 Hz
Dimensions	484 x 378 x 45 mm
Weight	5.6 kg

11 T-6245 Six Zone Mixer with Voice Recorder

11.1 General Information

The T-6245 is a six zone mixer with digital voice recorder. It's the ideal solution for any public address application like schools, hotels, offices and shops.

The T-6245 is designed to operate with the T-328 paging microphone (refer to [section 17](#)).

11.2 Features

- Selector for six zones, source and zone control
- Integrated microphone and storage for simple voice recordings
- Front panel with three keys to select the audio source
- The six zones paging microphone station is connected to the mixer via an RJ-45 port
- XLR microphone input with phantom power (48 V)
- Three AUX inputs for tape, CD and tuner
- Chime with volume control and contact input
- Six connectors for power amplifiers
- Four priority levels

11.3 Views

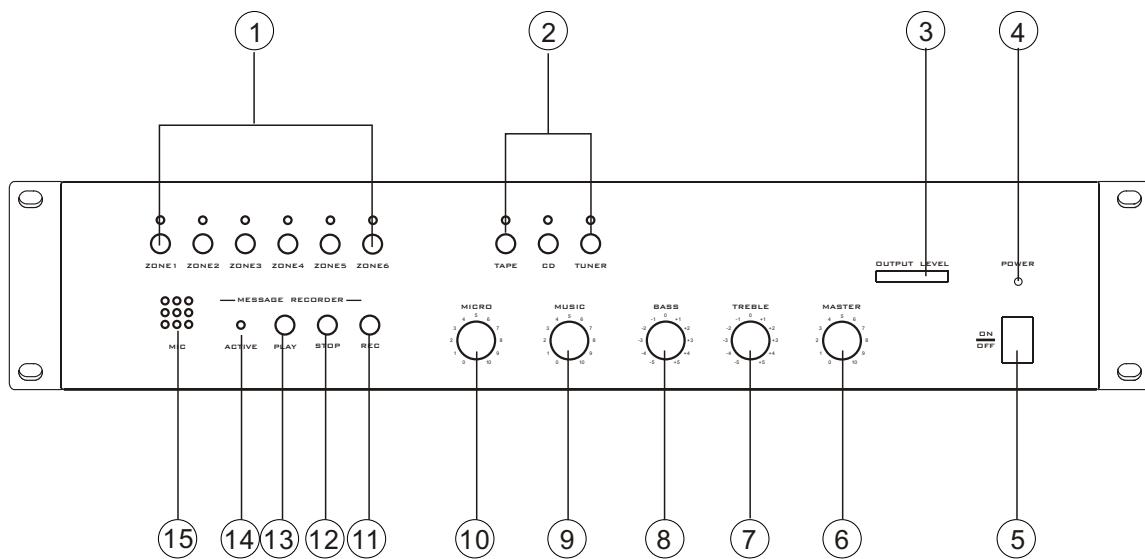


Figure 11.1: T-6245 - Front View

Front Panel

1	Zone Selector for BGM/Mic
2	Input Selector
3	Levelmeter
4	Power Indicator
5	Power Switch
6	Master Volume Mix (BGM/Mic)
7	Tone Control Treble (BGM/Mic)
8	Tone Control Bass (BGM/Mic)
9	Volume BGM
10	Volume Microphone
11	Text Memory Record
12	Text Memory Stop
13	Text Memory Play
14	Text Memory Activity Indicator
15	Internal Microphone

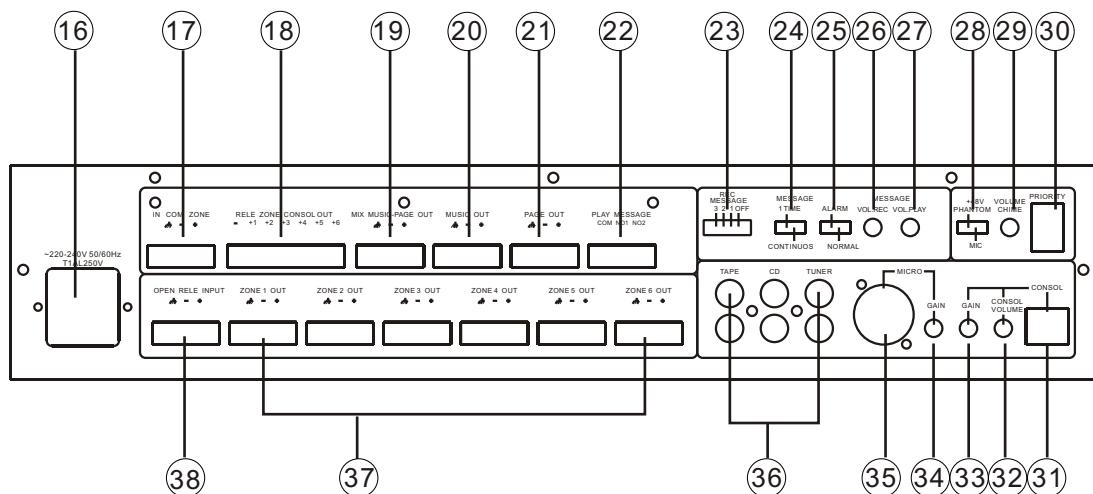


Figure 11.2: T-6245 - Rear View

 Rear Panel

- 16 Mains
- 17 Audio Input for Zone Relais BGM
- 18 Voltage Outputs „Zone active“
- 19 Audio Output Mix: Microphone, BGM, Pre-chime, Text Memory and external Paging Microphone
- 20 Audio Output Music: Microphone, BGM und Pre-chime
- 21 Audio Output Call: Text Memory and external Paging Microphone
- 22 Contact Input Play Text Memory 1 and 2
- 23 Selector Text Memory 1-3 for Record
- 24 Selector Text Memory single or continuous play (refer to [section 11.8](#))
- 25 Microphone Alarm Mode (refer to [section 11.7](#))
- 26 Volume Record Text Memory
- 27 Volume Play Text Memory
- 28 Phantom Power On/Off
- 29 Volume Pre-chime
- 30 Contact Input Pre-chime and Priority (refer to [section 11.7](#))
- 31 Connection Paging Microphone
- 32 Volume Paging Microphone
- 33 Gain Paging Microphone
- 34 Gain Microphone
- 35 Microphone Input XLR
- 36 Audio Inputs for BGM
- 37 Audio Outputs of Zone Relays 1-6
- 38 Audio Input for Zone Relays

11.4 Signal Routing

The audio sources are routed as follows:

Source	Output
RCA Inputs	Music, Mix
Mikrofon	Music, Mix
Sprachspeicher	Paging, Mix
Vorgong	Music, Mix
Sprechstelle	Paging, Mix

11.5 Zone Select for BGM/Mic

The six buttons on the front panel allow to route the audio signal of the BGM, microphone and pre-chime to the corresponding zones.



Caution

Selected zones will be lost if the T-6245 is being turned off and need to be activated again.

11.6 Voice Recording

A text can be recorded to the text memory as follows:

1. The memory location can be selected with the sliding switch (Point 23 of [section 11.3](#)) on the backside of the unit.
2. Press the recording key *REC* on the front side of the unit (Point 11 of [section 11.3](#)).
3. The activity indicator (Point 14 of [section 11.3](#)) will illuminate and the recording can be started.
4. *STOP* will exit the recording (Point 12 of [section 11.3](#)).
5. A recorded message will be played back by pressing the *PLAY* key (Point 13 of [section 11.3](#)).



Caution

The maximum length of a recording is 60 seconds.

Text memories 1 and 2 are triggered by the contact inputs on the rear of the unit, text memory 3 by the paging microphone T-328 (siehe [section 17](#)).

11.7 Microphone Alarm Mode

If a T-319 (refer to [section 16](#)) paging microphone is not available or being used, a simple PTT paging mic may be used instead:

1. The audio signal of the PTT paging mic is connected to the XLR microphone input (Point 35 of [section 11.3](#)).
2. The contact output of the PTT paging mic controls the contact input *Priority* (Point 30 of [section 11.3](#)) of the T-6245. This triggers the pre-chime and mutes the BGM.
3. The *Alarm Mode* switch (Point 25 of [section 11.3](#)) is set to *ALARM*. This activates all the zone relays.

By pressing the button on the PTT paging mic the pre-chime sounds and the microphone signal will be routed to all zones.

11.8 Repeat of Voice Recording

The switch *Message 1 Time/Continuous* (Point 24 of [section 11.3](#)) determines, whether the voice recordings 1 and 2 (triggered by a contact input) are played once or continuously.

In the case of *Continuous* the voice recording is repeated as long as the contact is closed. The last repeat of the voice recording is played to its end.



Caution

The repeat function is only active when the *Alarm Mode* switch (Point 25 of [section 11.3](#)) is set to *ALARM*.

11.9 Priority Mute

Different priorities apply to the audio sources:

	Priority	Source
1	High	External Paging Microphone
2	...	Pre-chime
3	...	Text Memory
4	Low	BGM

11.10 Connection Diagrams

Option 1: An amplifier for calls and BGM each.

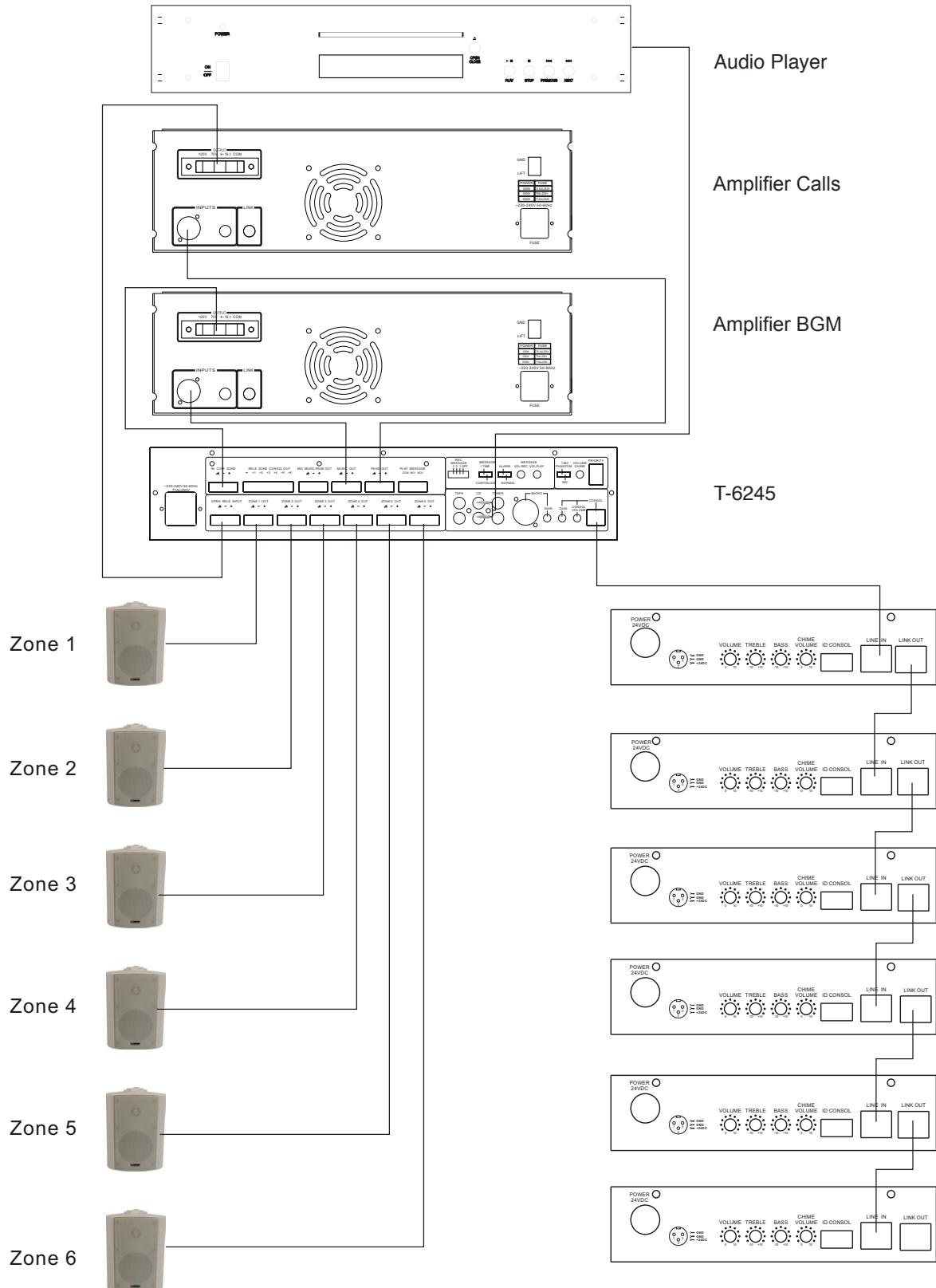


Figure 11.3: T-6245 - Connection Diagram 1

Option 2: One amplifier for each zone.

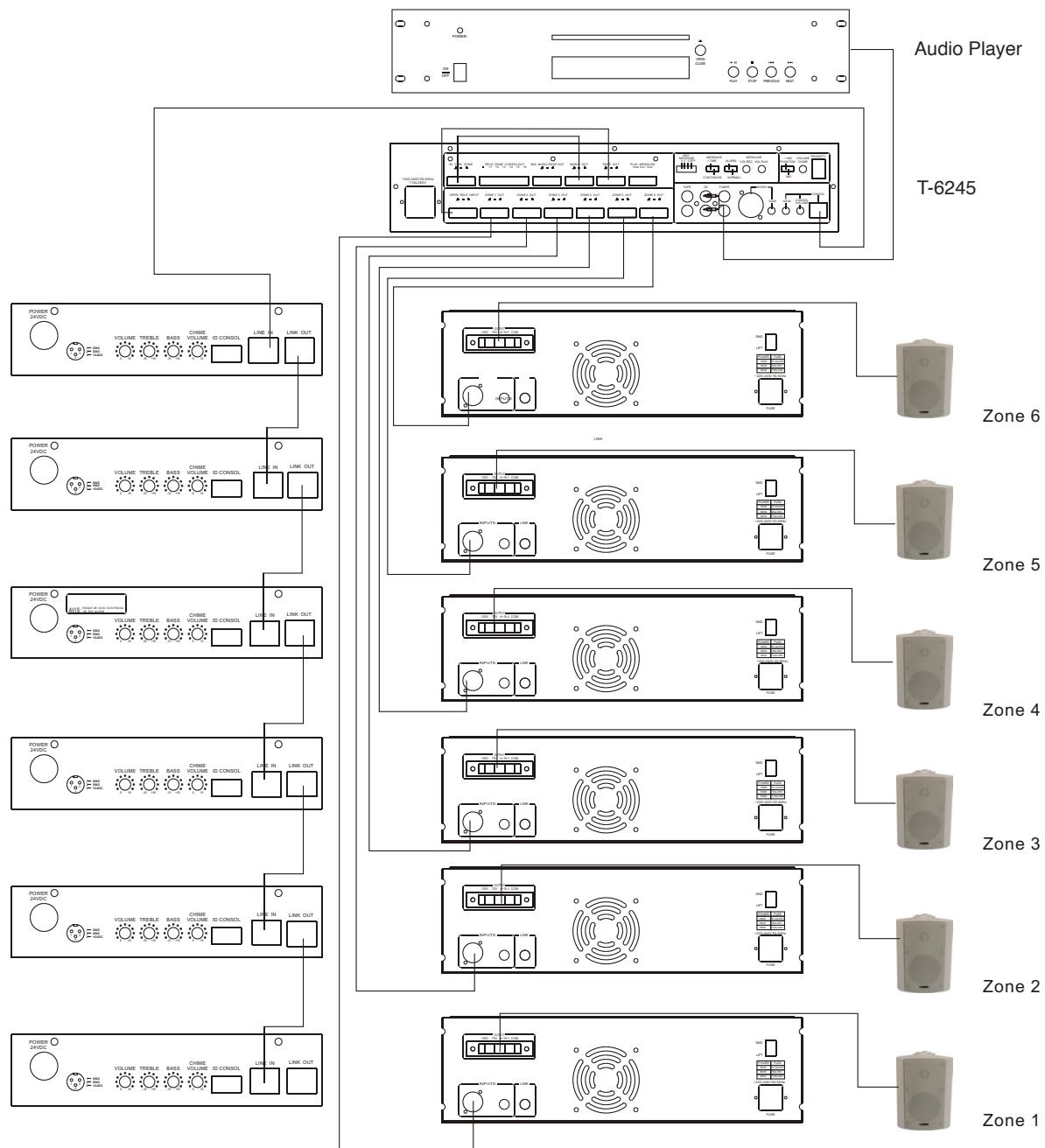


Figure 11.4: T-6245 - Connection Diagram 2

11.11 Technical Data

T-6245	
Microphone Input	Sensitivity: 5 mV /600 Ohms bal. XLR S/N: > 68 dB Frequency Response: 50 Hz - 17 kHz Phantom Power: 48 V switchable
Inputs Tuner /Tape	200 mV /47 kOhms, unbal. RCA
Input CD	500 mV /47 kOhms, unbal. RCA S/N: > 90 dB Frequency Response: 20 Hz - 20 kHz
THD	< 0.05 %
Tone Control Bass	+/- 12dB @ 100Hz
Tone Control Treble	+/- 12dB @ 10kHz
Mains	220-240 V AC, 50-60 Hz
Backup Power	24 V DC
Power Consumption	500 W
Dimensions	484 x 322 x 88 mm
Weight	6.6 kg

12 T-2150X/2300X Power Amplifier

12.1 General Information

The 2 channel amplifiers provide 2x 150 W and 2x 300 W output power. All connections are pluggable. All controls are on the front panel, ideal for locations where access to the back is restricted.

12.2 Features

- Protection circuits: DC, Thermal, Short Circuit
- Balanced Phoenix- and RCA-Jack-Inputs
- Phoenix loudspeaker outputs
- Levelmeter with 5 steps and Clip for each channel
- LED indicators for Protect and Power
- Temperature controlled, variable speed low noise fan
- Detent potentiometers
- Ground lift

12.3 Views

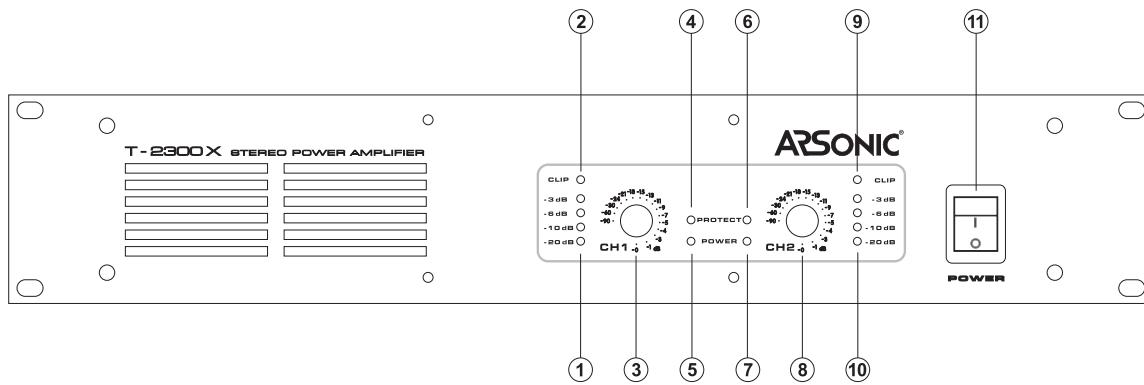


Figure 12.1: TX Series - Front View

Front Panel

- 1 Levelmeter Channel 1
- 2 Clip Channel 1
- 3 Level Channel 1
- 4 Protect Channel 1
- 5 Power Indicator Channel 1
- 6 Protect Channel 2
- 7 Power Indicator Channel 2
- 8 Level Channel 2
- 9 Clip Channel 2
- 10 Levelmeter Channel 2
- 11 Mains Switch

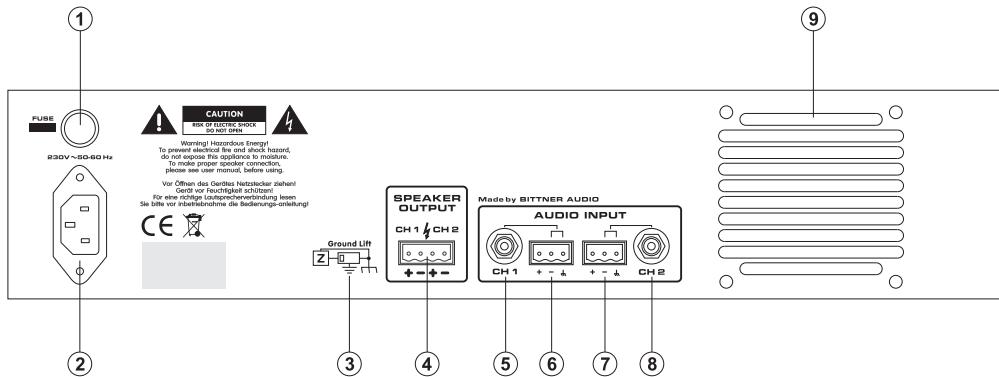


Figure 12.2: T-X Series - Rear View

Back Panel

1	Fuse
2	Main
3	Ground Lift (refer to section 12.6)
4	Loudspeaker Outputs (refer to section 12.5)
5	Input RCA Channel 1 (refer to section 12.4)
6	Input PHOENIX Channel 1 (refer to section 12.4)
7	Input PHOENIX Channel 2 (refer to section 12.4)
8	Input RCA Channel 2 (refer to section 12.4)
9	Fan

12.4 Audio Inputs

RCA

The RCA connections are unbalanced.



Caution

For a better noise suppression it is recommended to jumper the pins (+) and (-).

PHOENIX

The PHOENIX connections are electronically balanced. Each input has the 3 pins Signal (+), Signal (-) and Shield.



Caution

The RCA and PHOENIX inputs of a channel cannot be used simultaneously.

12.5 Speaker Connections

The PHOENIX audio connector contains two pins per channel: Signal (+) and Signal (-).



Caution

OUTPUT TERMINAL SAFETY WARNING! Do not touch output terminals while amplifier power is on. Make all connections with the amplifier disconnected from mains. Risk of hazardous energy!

12.6 Ground Lift

The chassis ground of the amplifier is connected with the ground of the AC power cord (the non-fused earthed protective conductor). Therefore, if several devices are connected in a signal chain a ground loop may be created. This ground loop will cause a compensating current to travel on the shields of the audio cables causing hum-problems.

The amplifiers of the T-X series are equipped with a *Ground Lift* switch on the back side of the unit.

It has three settings:

Character	Signification/meaning
	Signal ground (Audio) is separated from chassis ground
	Signal ground (Audio) is connected to chassis ground
	Signal ground (Audio) is connected to chassis ground via a 10 ohms resistor

Setting 1 and 3 will remove hum in most cases.



Caution

Although *Ground Lift* is a common and proven method, proper cabling and grounding should avoid hum in the first place.

Isolating the ground of the AC power cord is technically different and eliminates the protective earth connection. Therefore, **NEVER** isolate the ground of the AC power as this may pose a serious danger to your life.

12.7 Technical Data

T-2150X /T-2300X	
Output Power	T-2150X: 2x 150 W T-2300X: 2x 300 W
Loudspeaker Outputs	4–16 Ohms
Frequency Response	20 Hz - 20 kHz (0 dB, -0.3 dB)
THD	< 0.08 %
S/N	> 100 dB
Channel Separation	> 85 dB
Input Sensitivity	0 dB /20 kOhms
Mains	230 V AC, 50 Hz
Power Consumption	T-2150X: 350 W T-2300X: 550 W
Dimensions	482 x 320 x 88 mm
Weight	T-2150X: 10 kg T-2300X: 12 kg

13 T-6221 CD/MP3-Player

13.1 General Information

The T-6221 CD/MP3 Player was designed to be a budget-priced part of a public address system, but offers many functions in high quality. Typical applications are schools, factories, hospitals, shops and many more.

13.2 Features

- Supports music and MP3-CDs
- Fluorescent display
- Reads the SD card automatically in case no CD is available or the USB port is not in use
- Remote control included
- Auto Play
- Built-in monitor loudspeaker with volume control
- 1 RU

13.3 Views

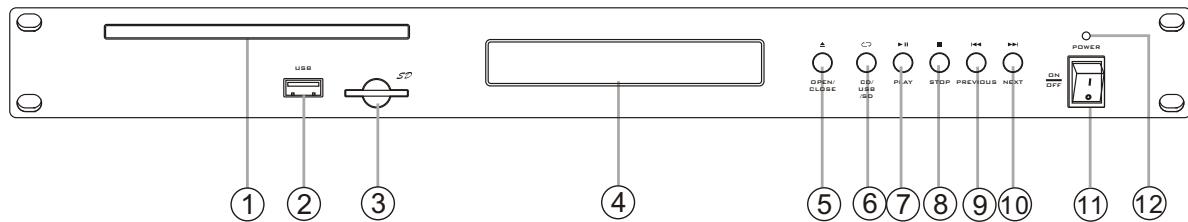


Figure 13.1: T-6221 - Front View

Front Panel	
1	CD Slot
2	USB Slot
3	SD Card Slot
4	Display
5	Eject
6	Operation Mode
7	Play/Pause
8	Stop
9	Previous Title
10	Next Title
11	Power Switch
12	Power Indicator



Figure 13.2: T-6221 - Rear View

Rear Panel	
13	Mains
14	Audio Outputs
15	Level Monitor Loudspeaker (refer to section 13.5)

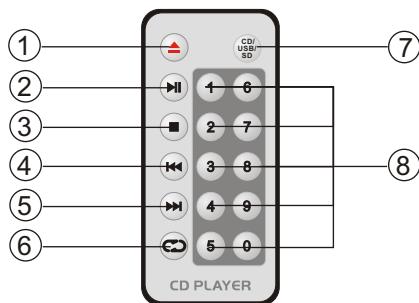


Figure 13.3: T-6221 - Remote Control

Remote Control	
1	Eject
2	Play/Pause
3	Stop
4	Previous Title
5	Next Title
6	Repeat
7	Operation Mode
8	Numeric Keys

13.4 Operation

Playback will automatically start with the first title. All other titles may be selected by *Previous* and *Next*.

The maximum storage capacity of a USB Stick or an SD-Card is 8 GByte.



Caution

The device is controlled by a microcontroller. Therefore, it should not be turned on and off in quick succession. In case of a replay error, please turn off the device and wait approximately 5 sec before turning it on again. This is the time the microcontroller requires to re-boot again.

13.5 Monitor Loudspeaker

The T-6221 provides a small monitor loudspeaker build into the side of the unit. Its volume can be controlled by the potentiometer on the rear of the T-6221.

13.6 Technical Data

T-6221	
Mains	230 V AC /50 Hz
Power Consumption	30 W
Dimensions	484 x 222 x 44 mm
Weight	3.6 kg

14 T-2221 CD/MP3-Player with Tuner

14.1 General Information

The T-2129 CD/MP3 Player was designed to be a budget-priced part of a public address system, but offers many functions in high quality. Typical applications are schools, factories, hospitals, shops and many more.

14.2 Features

- CD player, MP3, tuner
- USB and SD port
- AM/FM tuner with 99 bands
- Separate CD-/MP3 stereo output and tuner stereo output
- 2 displays for CD/MP3 and tuner
- Remote control included
- 1 RU

14.3 Views

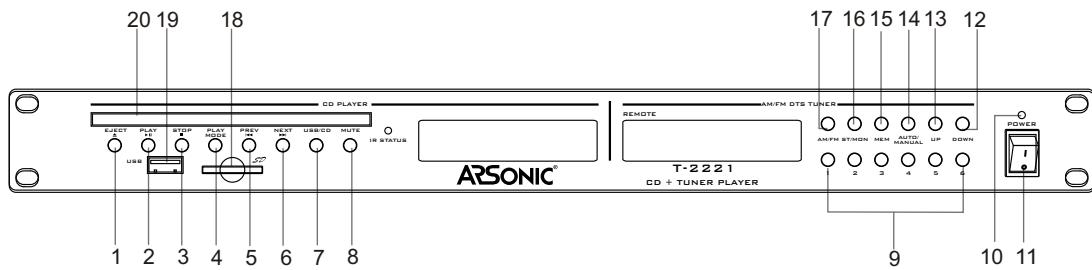


Figure 14.1: T-2221 - Front View

Front Panel	
1	Load/Eject
2	Play
3	Stop
4	Play Mode
5	Previous Title
6	Next Title
7	Selector CD/USB
8	Mute
9	Station Memory
10	Power Indicator
11	Power Switch
12	Down
13	Up
14	Station Search Auto/Manual
15	Memory save
16	Stereo/Mono
17	Selector AM/FM
18	SD Card Slot
19	USB Slot
20	CD Slot

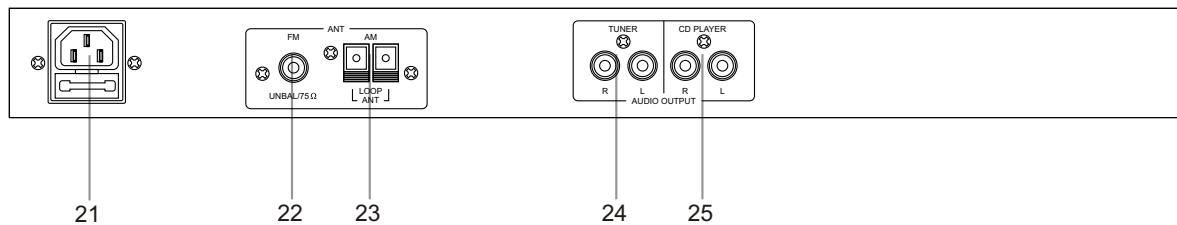


Figure 14.2: T-2221 - Rear View

Rear Panel	
21	Mains
22	FM Antenna
23	AM Antenna
24	Tuner Audio Outputs
25	CD Audio Outputs

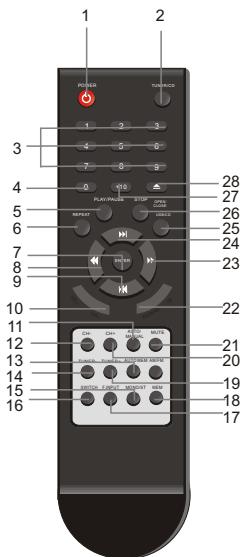


Figure 14.3: T-2221 - Remote Control

Remote Control

1	On/Off
2	Selector Tuner/CD
3+4	Numeric Keys
5	Play/Pause
6	Repeat
7	Enter
8	Rewind
9	Previous Title
10	Volume
11	Station Search Auto/Manual
12	Channel -
13	Auto Memory
14	Station Search -
15	Stereo/Mono
16	Display Station Memory/Frequency
17	Direct Frequency Input
18	Memory Save
19	Station Search +
20	Channel +
21	Mute
22	—
23	Forward
24	Next Title
25	Selector CD/USB
26	Stop
27	Number +10
28	Load/Eject

14.4 Operation

MP3 CDs will automatically start with the first title. All other titles may be selected by Previous and Next.

The maximum storage capacity of a USB Stick or an SD-Card is 8 GByte.

**Caution**

The device is controlled by a microcontroller. Therefore, it should not be turned on and off in quick succession. In case of a replay error, please turn off the device and wait approximately 5 sec before turning it on again. This is the time the microcontroller requires to re-boot again.

14.5 Technical Data

T-2221	
Mains	230 V AC /50 Hz
Power Consumption	35 W
Dimensions	484 x 222 x 44 mm
Weight	3.7 kg

15 T-318 Paging Microphone

15.1 General Information

T-318 paging microphone has been designed for the 5 zone mixer amplifier series TI-S ([section 8](#)) and may be remotely operated at a distance of up to 1 km.

The mixer amplifier provides the necessary DC power for distances up to 50 meters. Longer distances require the use of a separate 24 V DC power supply.

The T-318 paging station provides a direct control of the five amplifier zone outputs.

15.2 Features

- Condenser microphone
- 2-/4-tone chime selectable
- Individual zone/all zones call selectable
- Volume control of chime, microphone and system volume
- 10-segment level meter of the amplifier outputs
- 24 V DC input

15.3 Views

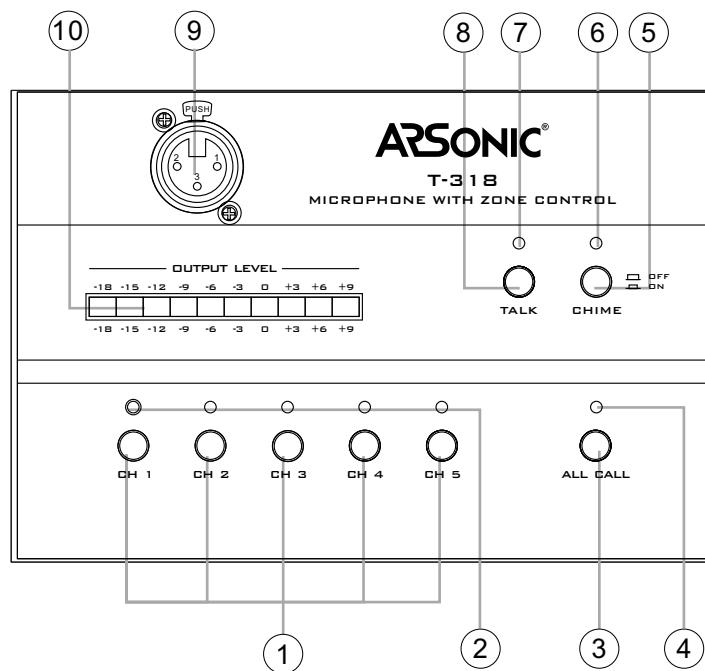


Figure 15.1: T-318 - Front View

Top Panel

- 1 Zone Buttons
- 2 Zone Indicators
- 3 All Zones Button
- 4 All Zones Indicator
- 5 Chime
- 6 Chime Indicator
- 7 Call Button Indicator
- 8 Call Button
- 9 Microphone Jack
- 10 Levelmeter

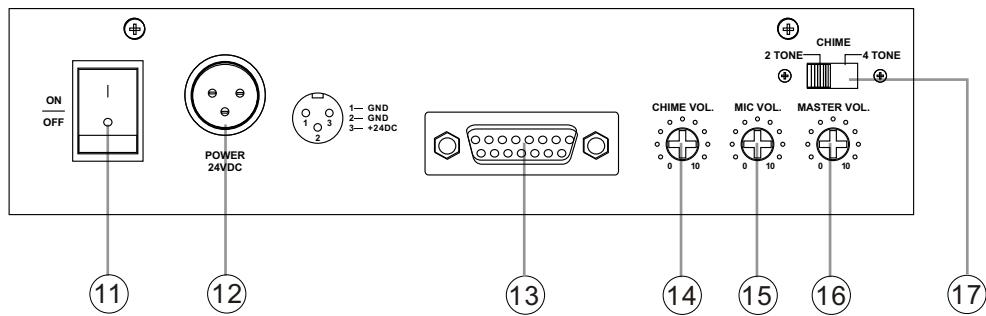


Figure 15.2: T-318 - Rear View

Rear Panel	
11	Power Switch
12	Power Connector 24 V DC
13	Control Inputs or connection to TI-S series (refer to section 8)
14	Volume Chime
15	Volume Microphone
16	Master Volume
17	Selector 2- or 4-Tone Chime



Figure 15.3: T-318 - 24 VDC Anschluss

Layout 15-pin Sub-D	
1	Audio Input Plus
2	Audio Input Minus
3	Audio Input Masse
4	Contact Input Zone 1
5	Contact Input Zone 2
6	Contact Input Zone 3
7	Contact Input Zone 4
8	Contact Input Zone 5
9	Common Ground Contact Inputs
10	+24V DC
11–15	n/a

15.4 Connection Diagram

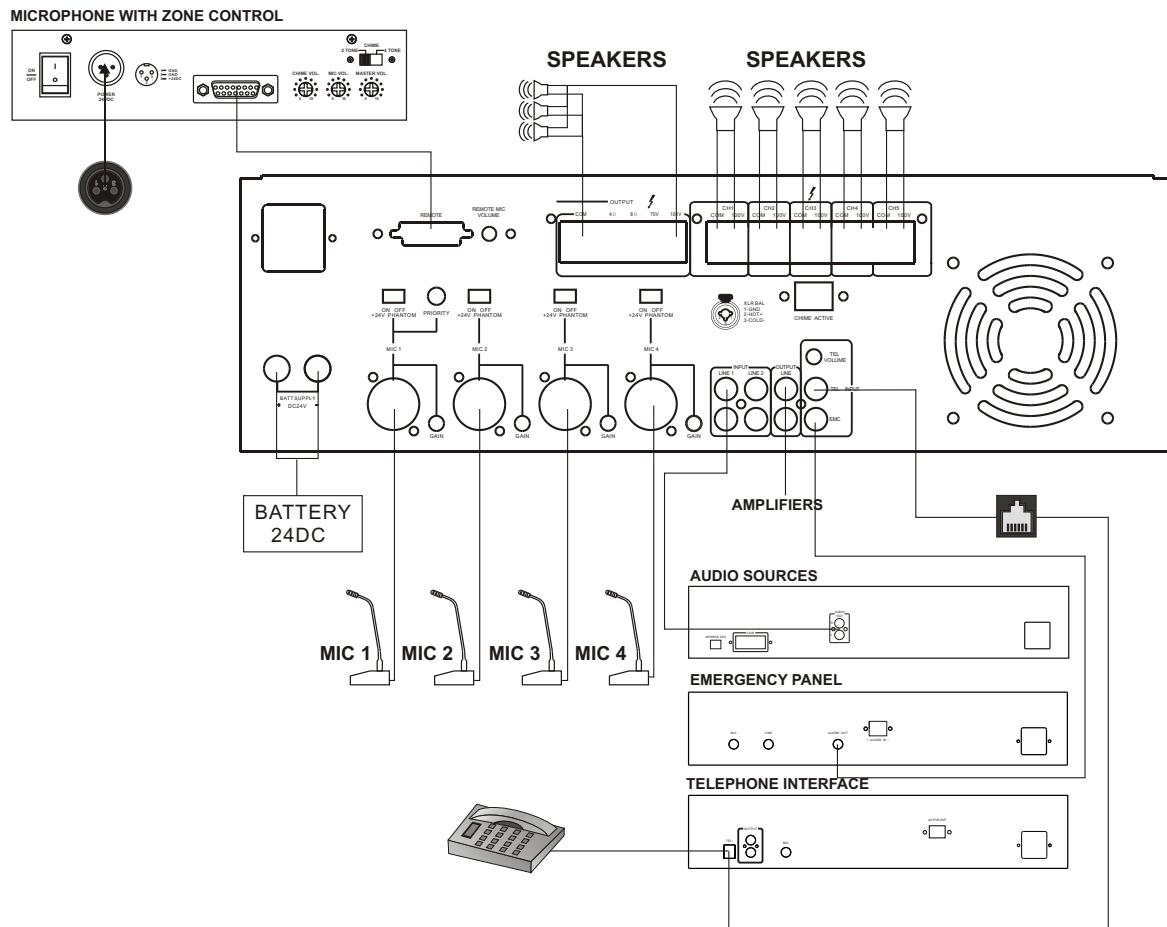


Figure 15.4: T-318 - Connection Diagram

15.5 Technical Data

T-318	
Microphone	Condenser
Output Level	0 dBu (600 Ohms) bal.
Input Sensitivity	-50 dB (600 Ohms) bal.
Frequency Response	50 Hz - 18 kHz (-3 dB)
THD	< 0.1 %
S/N	> 65 dB
Supply Voltage	24 V DC (Sub-D connection)
Weight	960 g (without microphone)
Dimensions (W x D x H)	198 x 115 x 47 mm

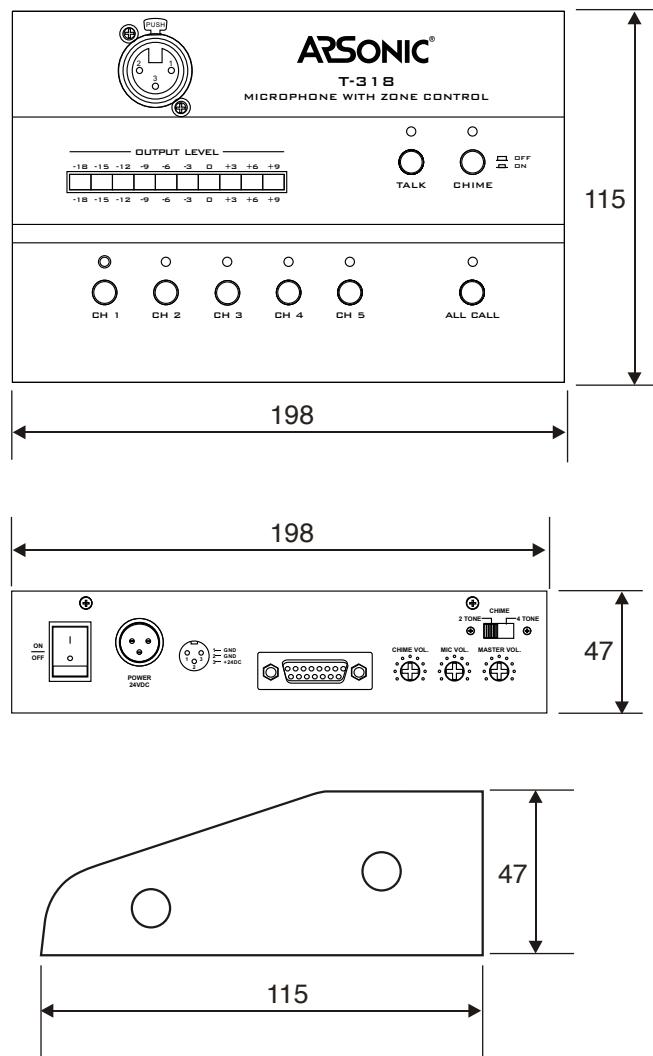


Figure 15.5: T-318 - Dimensions

16 T-319 Paging Microphone

16.1 General Information

The T-319 paging microphone may be operated up to 1 km distant from the mixer pre-amplifier T-2S01 ([section 10](#)).

For distances greater than 50 m an external 24 V DC power supply is required.

Talk or a 2-tone pre-chime may be triggered by a push button.

16.2 Features

- Condenser microphone
- Talk and chime trigger keys
- 10-segment LED display
- Volume control
- Optional DC power supply

16.3 Views

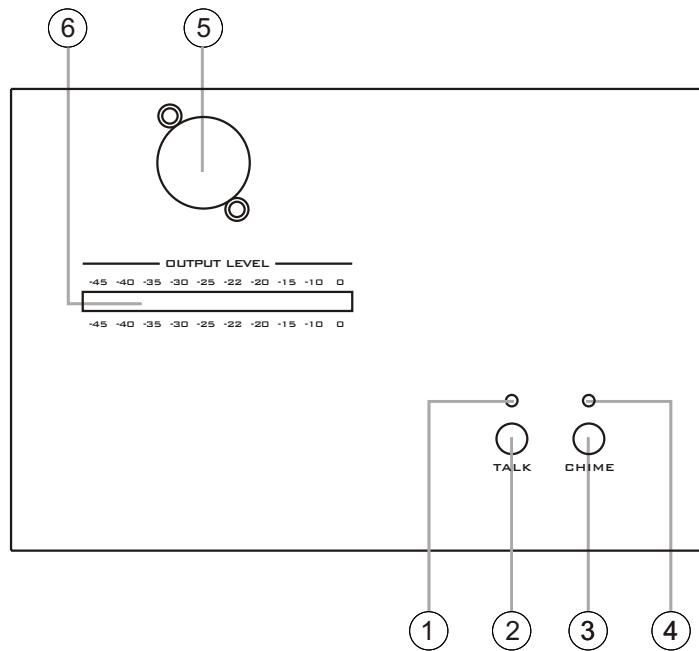


Figure 16.1: T-319 - Front View

Top Panel

- 1 Call Button Indicator
- 2 Call Button
- 3 Chime Button
- 4 Chime Indicator
- 5 Microphone Jack
- 6 Levelmeter

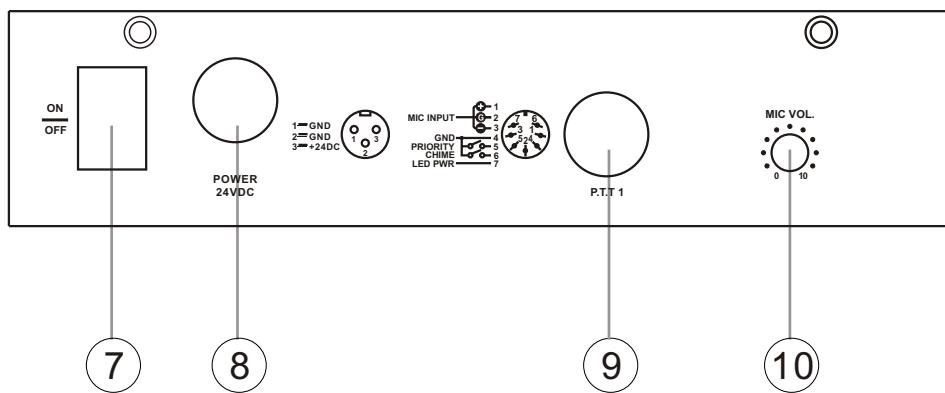


Figure 16.2: T-319 - Rear View

Rear Panel

- 7 Power Switch
- 8 Power Connector 24 V DC
- 9 Connection to T-2S01 (refer to section 10)
- 10 Volume Microphone



Figure 16.3: T-319 - 24 VDC Connector

16.4 Connection Diagram

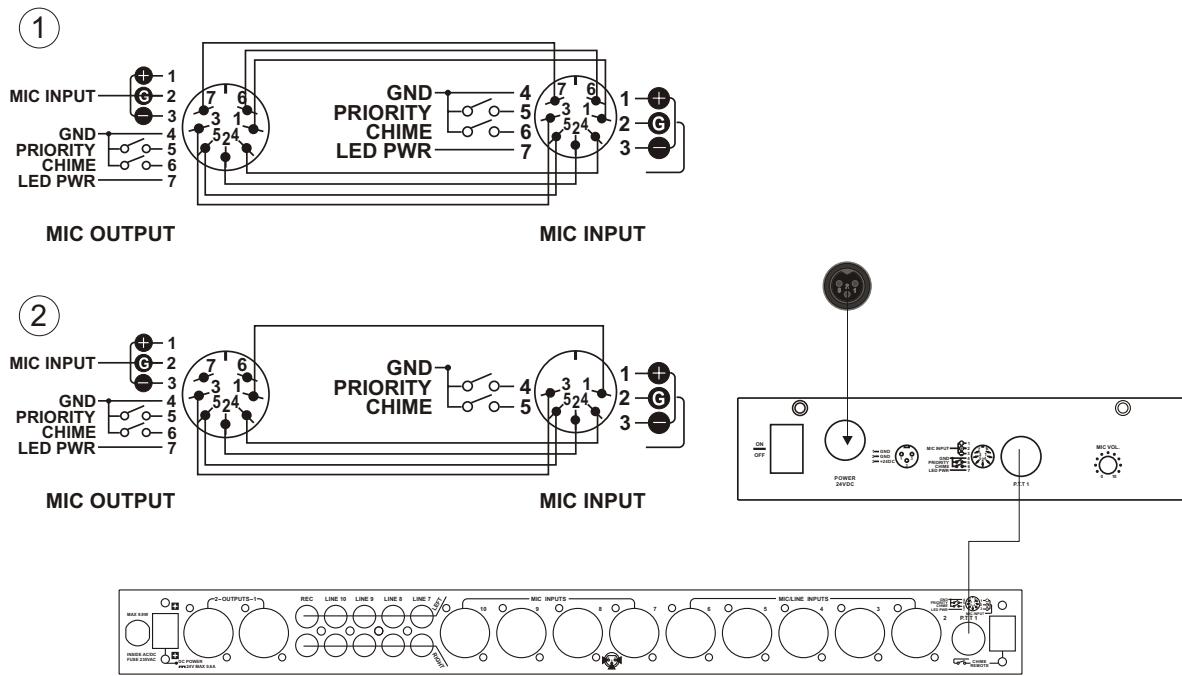


Figure 16.4: T-319 - Connection Diagram

16.5 Technical Data

T-319	
Microphone	Condenser
Output Level	0 dBu (600 Ohms) bal.
Input Sensitivity	-50 dB (600 Ohms) bal.
Frequency Response	50 Hz - 18 kHz (-3 dB)
THD	< 0.1 %
S/N	> 65 dB
Supply Voltage	24 V DC
Weight	960 g (without Microphone)
Dimensions (W x D x H)	198 x 115 x 47 mm

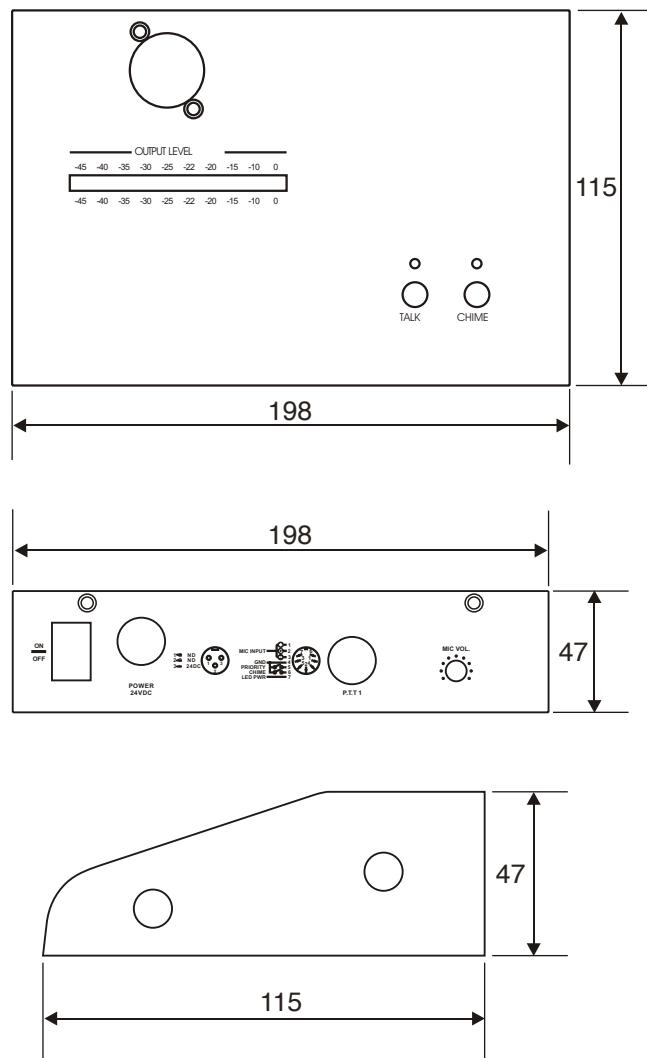


Figure 16.5: T-319 - Dimensions

17 T-328 Paging Microphone

17.1 General Information

The T-328 paging station has been designed as remote control and microphone for the T-6245 mixer ([Section 11](#)).

Direct access to the desired zone with six keys. The ALARM key activates the pre-recorded message.

For distances greater than 50 m from the mixer, an external 24 V DC power supply is required.

Two RJ-45 ports for the connection to the mixer and the next paging station. Up to six paging stations may be connected simultaneously.

17.2 Features

- Selection of zones
- Paging with „busy“ indication
- Activation of pre-recorded announcements
- Simultaneous operation of up to six paging stations

17.3 Views

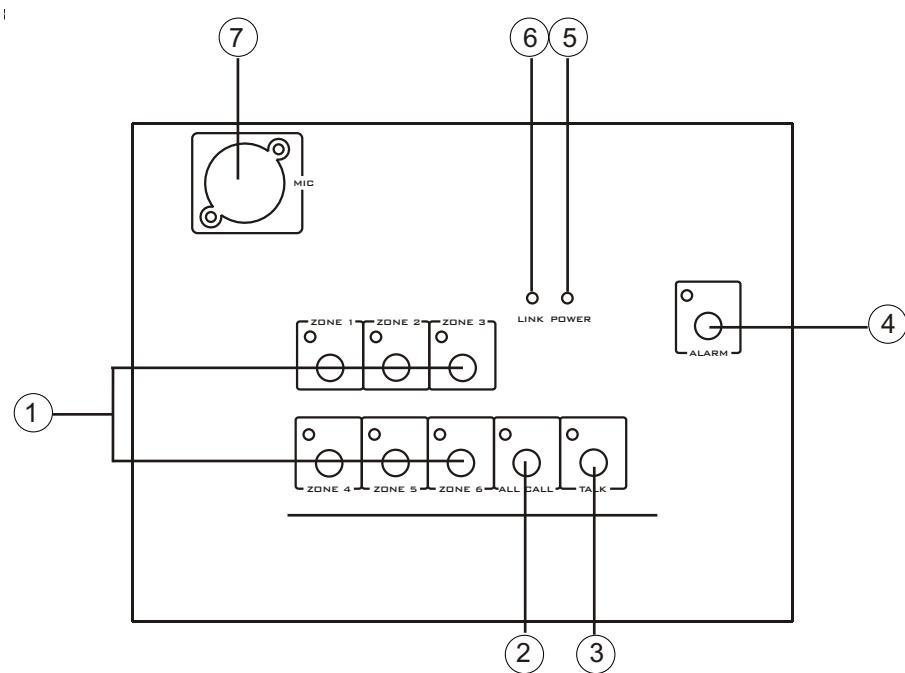


Figure 17.1: T-328 - Front View

Top Panel

- 1 Zone Selector with Indicator
- 2 All Call with Indicator
- 3 Call Button
- 4 Emergency Call (refer to [section 17.4](#))
- 5 Power Indicator
- 6 Link Indicator
- 7 Microphone Jack

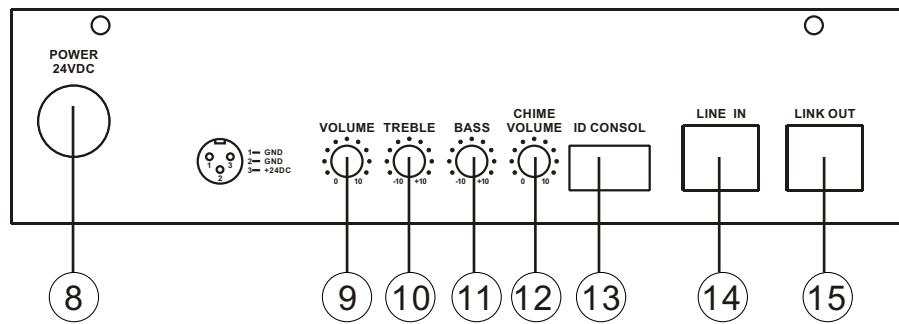


Figure 17.2: T-328 - Rear View

Rear Panel	
8	Power Connector 24 V DC
9	Volume Microphone
10	Tone Control Treble
11	Tone Control Bass
12	Volume Pre-chime
13	DIP-Switch for ID
14	Bus Connection In
15	Bus Connection Out



Figure 17.3: T-328 - 24 VDC Connector

17.4 Emergency Call

The emergency call is activated by pressing the button *Alarm* for more than 2 seconds. The voice message is repeated as long as the button is activated.

17.5 Connection Diagram

You will find detailed Connection Diagrams in conjunction with the T-6245 in [section 11.10](#).

17.6 Technical Data

T-328	
Microphone	Condenser
Output Level	0 dBu (600 Ohms) bal.
Input Sensitivity	-50 dB (600 Ohms) bal.
Frequency Response	50 Hz - 18 kHz (-3 dB)
THD	< 0.1 %
S/N	> 68 dB
Phantom Power	12 V
Tone Control Bass	+/- 12dB @ 100Hz
Tone Control Treble	+/- 12dB @ 10kHz
Supply Voltage	24 V DC
Weight	960 g (without Microphone)
Dimensions (W x D x H)	220 x 144 x 55 mm

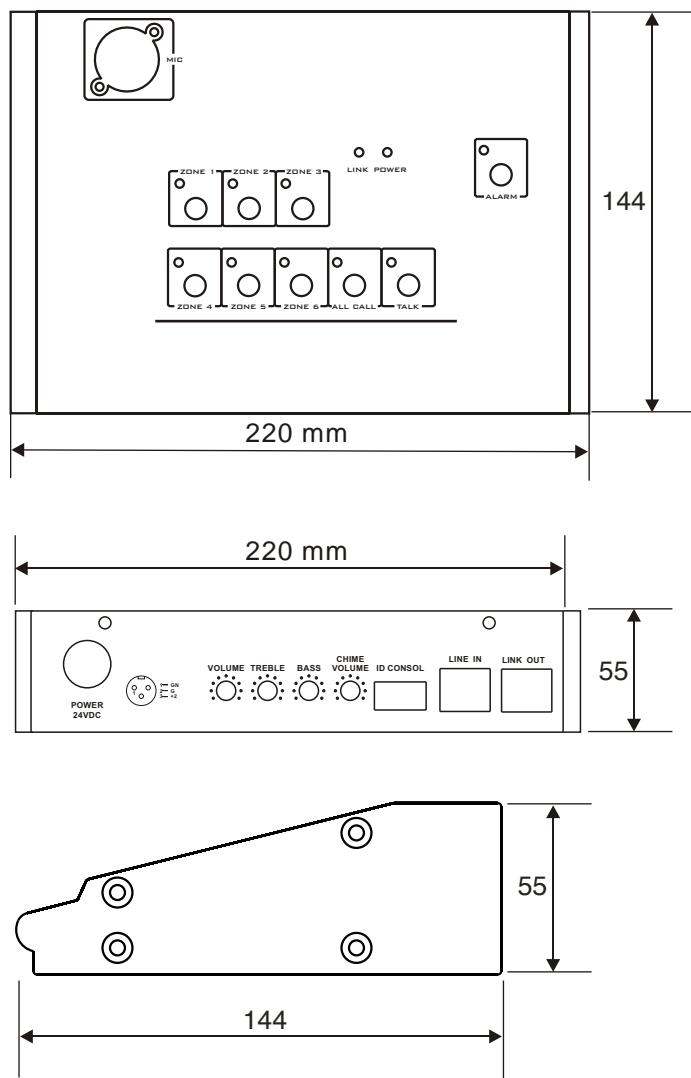


Figure 17.4: T-328 - Dimensions

18 T-4012 Paging Microphone

18.1 General Information

The T-4012 four zones paging microphone station has been designed to work exclusively with the T4060MP and T-4120 MP mixing amplifiers ([section 9](#)).

It is connected via CAT 5 cable and RJ-45 connector. Up to 6 mic stations may be cascaded and linked to one T-4060MP or T-4120MP mixing amplifier.

It is powered by 24V supplied by the amplifier. Maximum cable length is 1 km.

18.2 Features

- 4 zone paging station
- Zone, group zone and all zones paging capability
- Up to 6 mic stations per amplifier
- CAT 5 cable connection
- Built-in pre-announcement chime
- Microphone level, chime and master volume control
- 10 segment level meter

18.3 Views

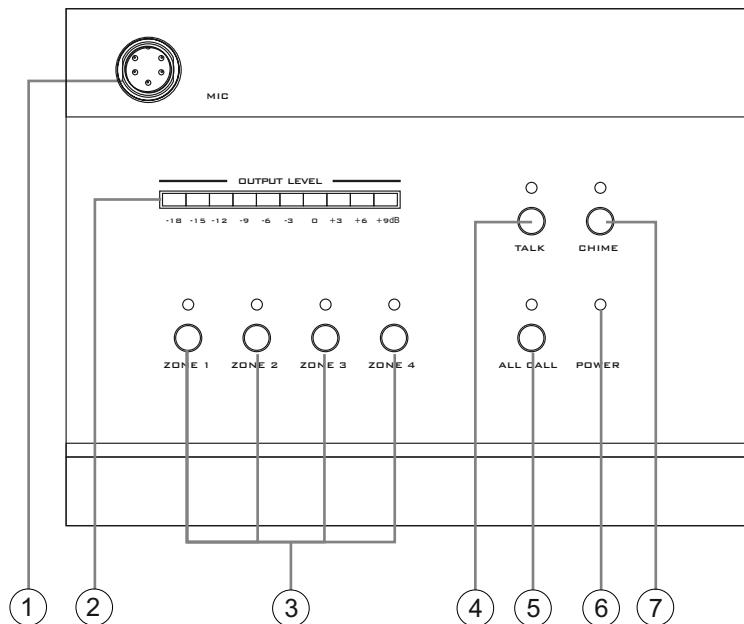


Figure 18.1: T-4012 - Front View

Top Panel

- 1 Microphone Jack
- 2 Levelmeter
- 3 Zone Selector with Indicator
- 4 Call Button with Indicator
- 5 All Call with Indicator
- 6 Power Indicator
- 7 Pre-chime with Indicator

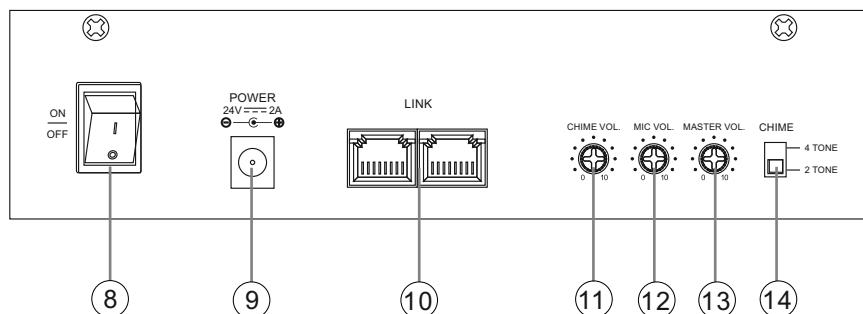


Figure 18.2: T-4012 - Rear View

Rear Panel

- 8 Power Switch
- 9 Power Connector 24 V DC
- 10 Bus Connections
- 11 Volume Pre-chime
- 12 Volume Microphone
- 13 Master Volume
- 14 Selector 2- or 4-Tone Chime

18.4 Connection Diagram

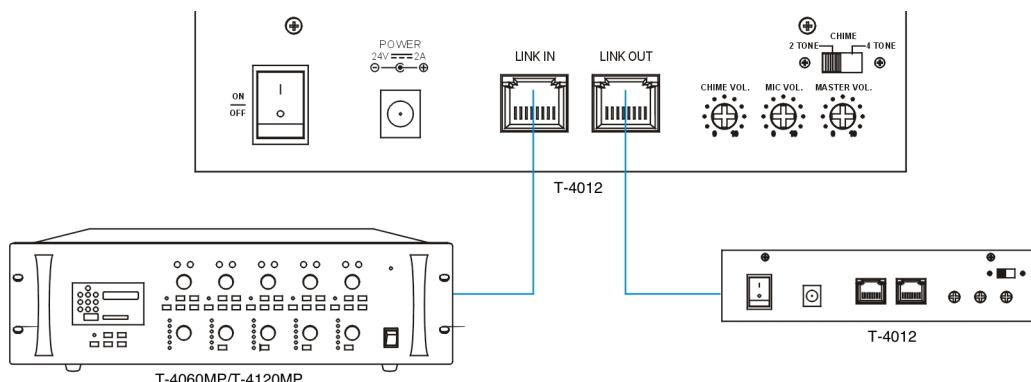


Figure 18.3: T-4012 - Connection Diagram

18.5 Technical Data

T-4012	
Microphone	Condenser
Output Level	0 dBu (600 Ohms) bal.
Input Sensitivity	-50 dB (600 Ohms) bal.
Frequency Response	50 Hz - 18 kHz (-3 dB)
THD	< 0.1 %
S/N	> 68 dB
Supply Voltage	24 V DC
Weight	960 g (without Microphone)
Dimensions (W x D x H)	220 x 144 x 55 mm

19 T-511C Microphone

19.1 Features

- Cardioid condenser microphone
- Phantom power
- Call Button
- Power indicator
- Flexible gooseneck
- Pluggable XLR cable

19.2 On/Off Button

The T-511C comes with an on/off button for the microphone. Each press of the button toggles between the two states.

19.3 Technical Data

T-511C	
Polar Pattern	Cardioid
Sensitivity	-47 dB +/-3 dB
Frequency Response	60 Hz - 15 kHz
Output Impedance	< 200 Ohm
Phantom Power	11 - 52 V
Cable	3 m (XLR, pluggable)
Weight	900 g

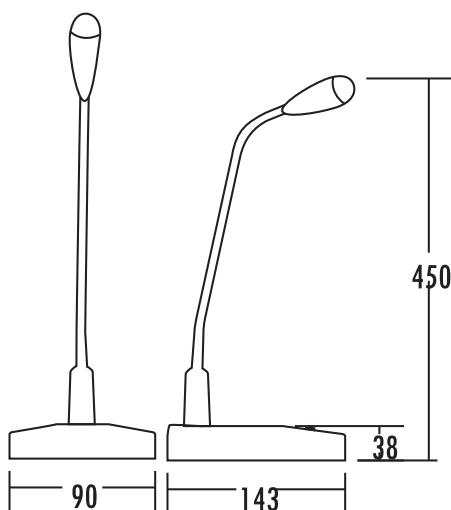


Figure 19.1: T-511C - Dimensions

20 T-531 Microphone

20.1 Features

- Unidirectional condenser microphone
- Phantom power
- Red ring power indicator
- Built-in low frequency attenuator
- Flexible gooseneck

20.2 On/Off Button

The T-511C comes with an on/off button for the microphone. Each press of the button toggles between the two states.

20.3 Technical Data

T-531	
Polar Pattern	Unidirectional
Sensitivity	-47 dB +/-3 dB
Frequency Response	50 Hz - 18 kHz
Ausgang	XLR bal.
Phantom Power	48 V
Cable Length	3 m (fixed)
Weight	900 g

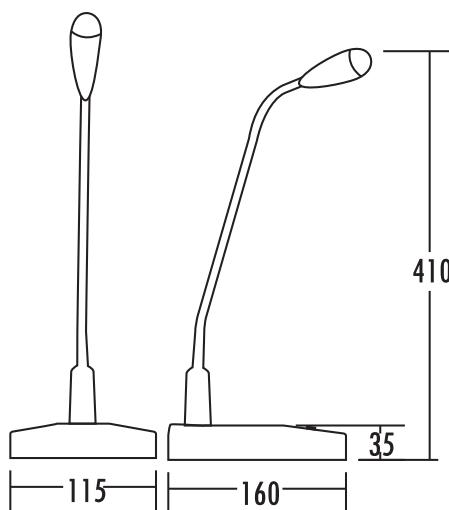


Figure 20.1: T-531 - Dimensions

List of Figures

2.1 T-8000 - Front View	7
2.2 T-8000 - Rear View	8
2.3 T-8000 Series - Connection Diagram	12
3.1 T-8000A - Front View	15
3.2 T-8000A - Rear View	16
4.1 T-8000AE - Front View	17
4.2 T-8000AE - Connection Diagram	18
4.3 T-8000AE - DIP Schalter	18
5.1 T-8000B - Front and Rear View	20
6.1 T-BU Series - Front View	22
6.2 T-BU - Rear View	23
6.3 T-BU Series - Speaker Connection	23
6.4 T-BU Series - Connection Diagram	24
7.1 TI-BU Series - Front View	27
7.2 TI-BU - Rear View	28
7.3 TI-BU Series - Speaker Connection	28
7.4 TI-BU Series - Connection Diagram	29
8.1 TI-S Series - Front View	32
8.2 TI-S - Rear View	33
8.3 TI-S Series - Speaker Connection	33
8.4 TI-S Series - Connection Diagram	35
9.1 T-MP Series - Front View	38
9.2 T-MP Series - Back View	39
9.3 T-MP Series - Speaker Connection	40
10.1 T-2S01 - Front View	43
10.2 T-2S01 - Rear View	43
10.3 T-2S01 - Connection Diagram	44
11.1 T-6245 - Front View	47
11.2 T-6245 - Rear View	48
11.3 T-6245 - Connection Diagram 1	51
11.4 T-6245 - Connection Diagram 2	52
12.1 T-X Series - Front View	55
12.2 T-X Series - Rear View	56
13.1 T-6221 - Front View	60
13.2 T-6221 - Rear View	60
13.3 T-6221 - Remote Control	61
14.1 T-2221 - Front View	63
14.2 T-2221 - Rear View	63
14.3 T-2221 - Remote Control	64
15.1 T-318 - Front View	67
15.2 T-318 - Rear View	68
15.3 T-318 - 24 VDC Anschluss	68
15.4 T-318 - Connection Diagram	69
15.5 T-318 - Dimensions	70

16.1 T-319 - Front View	72
16.2 T-319 - Rear View	72
16.3 T-319 - 24 VDC Connector	73
16.4 T-319 - Connection Diagram	73
16.5 T-319 - Dimensions	74
17.1 T-328 - Front View	76
17.2 T-328 - Rear View	77
17.3 T-328 - 24 VDC Connector	77
17.4 T-328 - Dimensions	78
18.1 T-4012 - Front View	80
18.2 T-4012 - Rear View	80
18.3 T-4012 - Connection Diagram	81
19.1 T-511C - Dimensions	82
20.1 T-531 - Dimensions	83